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Ontario

Ontario Geological Survey
Open File Report 6082

Report of Activities, 2001
Resident Geologist Program

Timmins Regional Resident Geologist
Report: Timmins and Sault Ste. Marie Districts

2002

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Ontario

ONTARIO GEOLOGICAL SURVEY

Open File Report 6082

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Timmins Regional Resident Geologist Report:
Timmins and Sault Ste. Marie Districts

by

B.T. Atkinson, M. Hailstone, G.Wm. Seim, D.M. Draper, D. Farrow and P. Hope

2002

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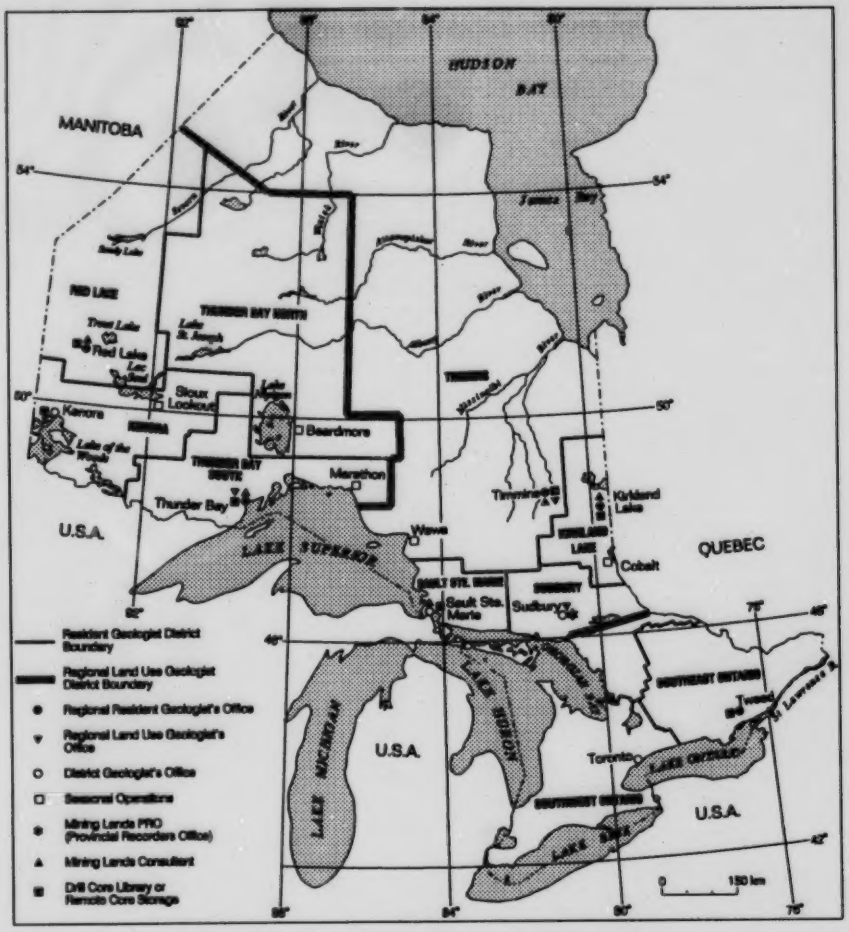

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ONTARIO GEOLOGICAL SURVEY

RESIDENT GEOLOGIST PROGRAM

REPORT OF ACTIVITIES - 2001

TIMMINS REGIONAL RESIDENT GEOLOGIST REPORT

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Regional Resident Geologist Program

Timmins Regional Resident Geologist (Timmins District)–2001

by

B.T. Atkinson, G.Wm. Seim, D.M. Draper and P. Hope

2002

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Timmins Regional Resident Geologist (Timmins District)–2001

B.T. Atkinson[1], G.Wm. Seim[2], D.M. Draper[3] and P. Hope[4]

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[4]District Support Geologist, Timmins District, Resident Geologist Program, Ontario Geological Survey

INTRODUCTION

Over the year, exploration activity increased substantially as indicated by a 65% increase in the number of claims staked, a marked decline in claim cancellations and an accompanying rise in exploration expenditures on grass roots projects. Comparative claim statistics are presented in Table 1. Mine development expenditures showed a significant increase as major projects progressed. At the Kidd Creek Mine, Falconbridge Limited is proceeding with the Deep Mine project. Falconbridge also commenced a pre-feasibility study on the Montcalm nickel copper deposit with the objective of bringing it to a pre-production stage. River Gold Mines Ltd. continued a shaft deepening project at the Eagle River Mine near Wawa with a budgeted cost of $3.5 million.

Agrium Inc. continued open pit production of phosphate ore by recovering and concentrating apatite sands from its Kapuskasing phosphate operations. Adjustments to the milling operations were made to improve recovery and grade of the phosphate concentrate prior to shipment to their Red Water, Alberta fertilizer plant.

Both Dome Mine and Hoyle Pond Mine continued gold production in Timmins and the Eagle River Mine produced gold near Wawa.

The search for diamonds continued in the Wawa area, throughout the Kapuskasing structure and in the James Bay Lowlands. De Beers Canada Corporation completed a desk top study on the Victor kimberlite pipe located 90 km west of Attawapiskat and advanced the project to the pre-feasibility stage.

"Discover Abitibi" is a $10 million geoscientific initiative consisting of industry and government funded surveys to increase knowledge of the Abitibi subprovince in an effort to assist in the discovery of new mines. The focus of the program is the Timmins and Kirkland Lake portions of the Abitibi subprovince.

Exploration activities for the Sault Ste Marie District are described in a separate chapter within this report.

Table 1. Summary of claims recorded and assessment work credit in the Timmins District, 1995 – 2001.

Year	Claim Units Recorded	Claim Units Cancelled	Claim Units Active	Diamond Drilling ($)	Physical Work ($)	Geotechnical Work* ($)	Total ($)
2001	18 258	11 759	42 835	N/A	N/A	N/A	4 996 755
2000	11 035	15 723	35 905	N/A	N/A	N/A	4 946 371
1999	12 312	16 557	42 270	N/A	N/A	N/A	10 665 577
1998	12 642	11 300	46 515	N/A	N/A	N/A	17 308 110
1997	10 771	16 908	45 173	N/A	N/A	N/A	10 707 864
1996	13 859	15 876	50 739	4 788 424	216 812	3 288 156	8 418 072
1995	14 376	7 769	60 705	2 003 632	202 191	2 742 497	5 052 359

** As of 1992, Geological and Geophysical Survey data are combined as Geotechnical Work*
N/A *Not available, figures no longer reported separately as of 1997.*

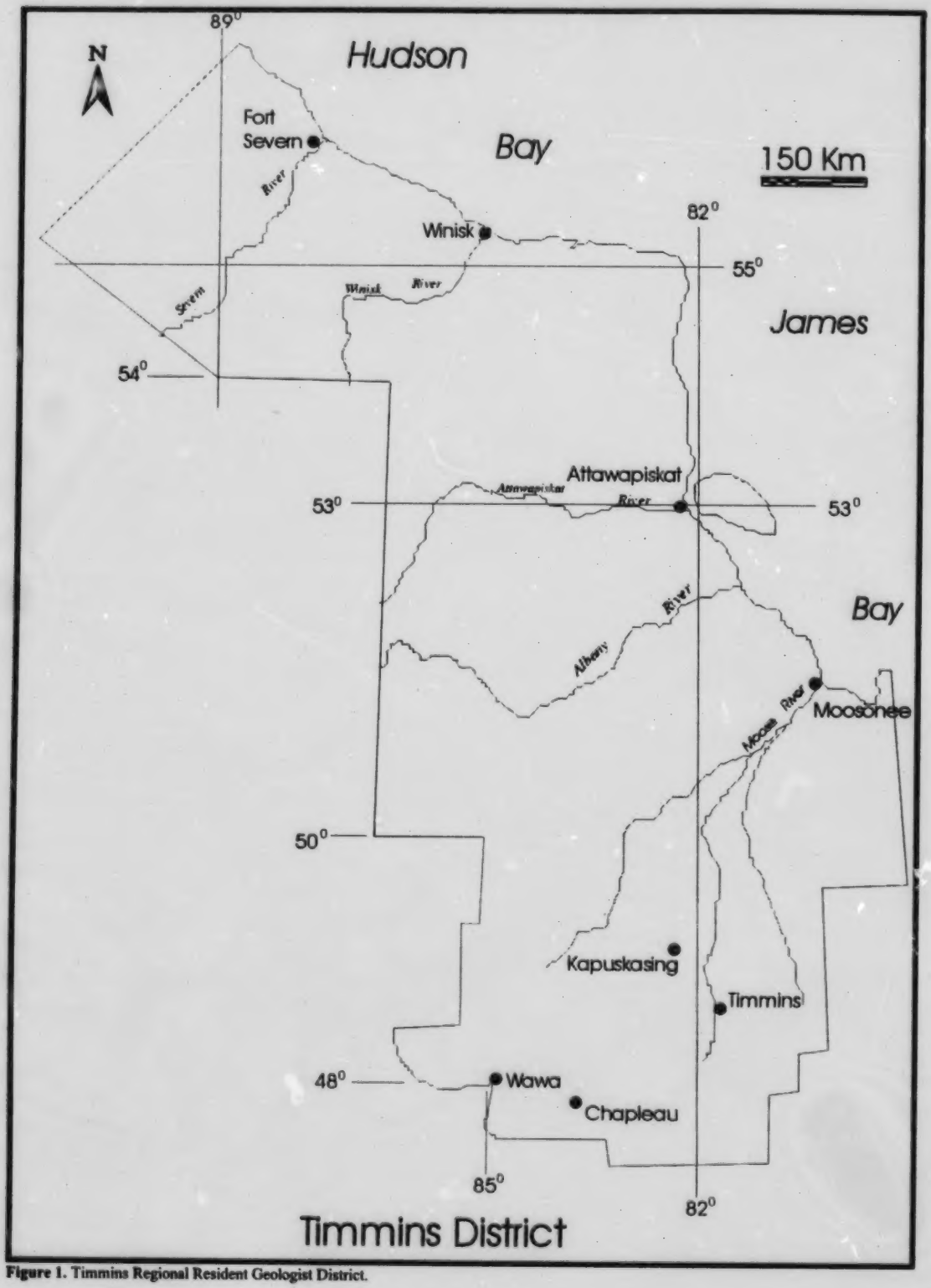

Figure 1. Timmins Regional Resident Geologist District.

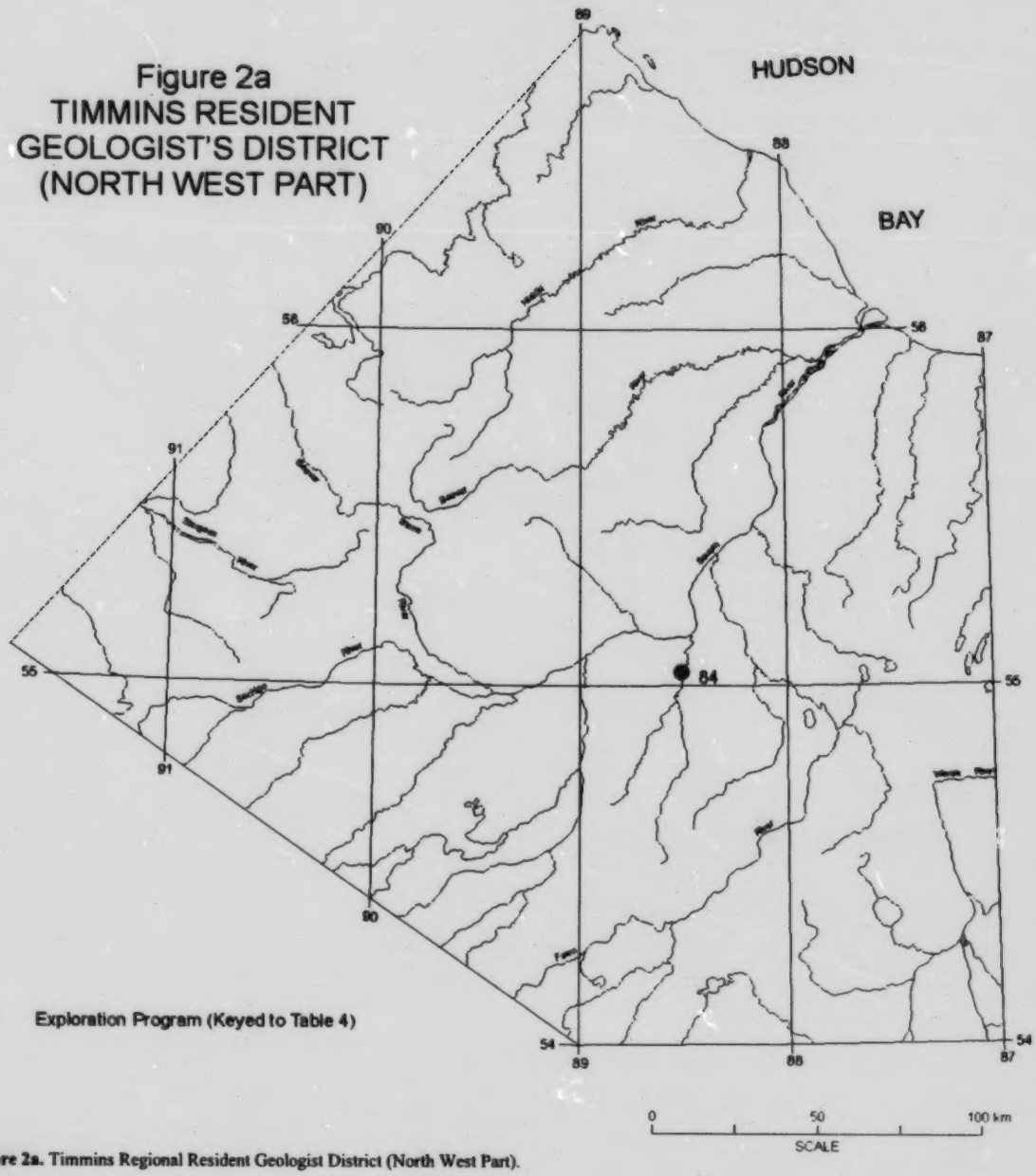

Figure 2a. Timmins Regional Resident Geologist District (North West Part).

Figure 2b
TIMMINS RESIDENT GEOLOGIST'S DISTRICT (NORTH EAST PART)

No Exploration Activity

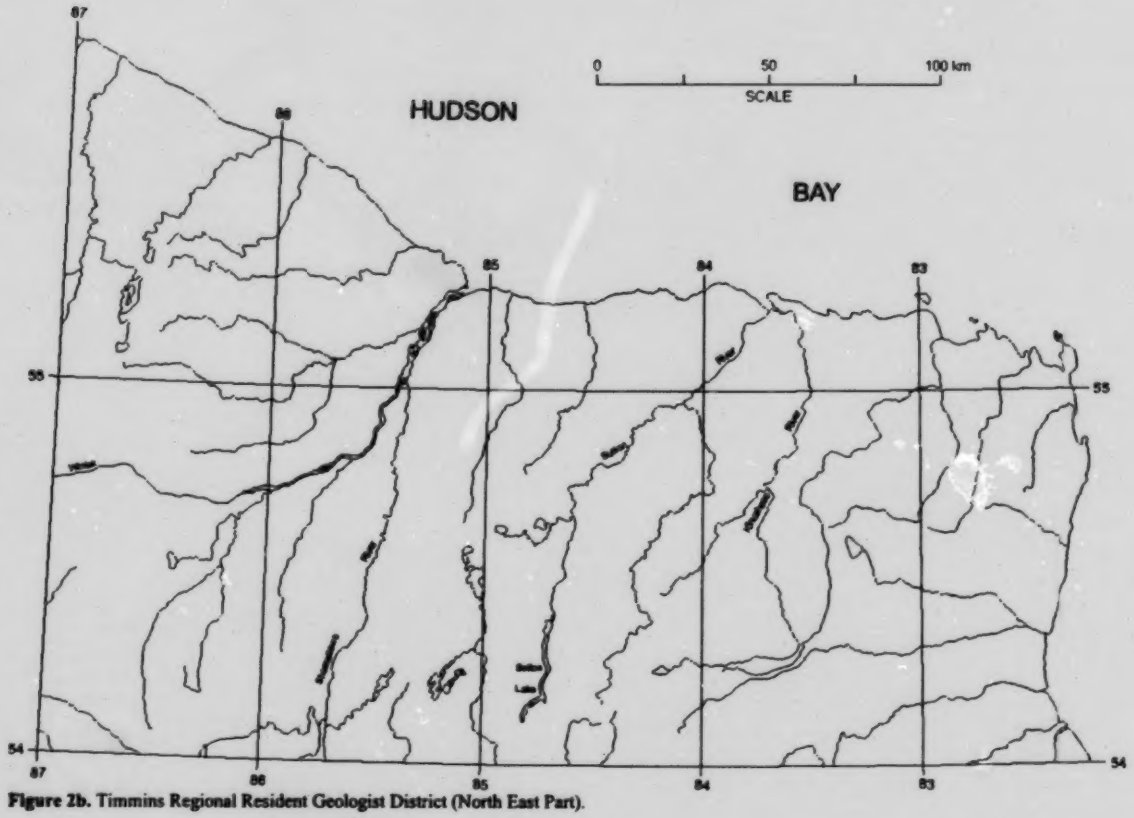

Figure 2b. Timmins Regional Resident Geologist District (North East Part).

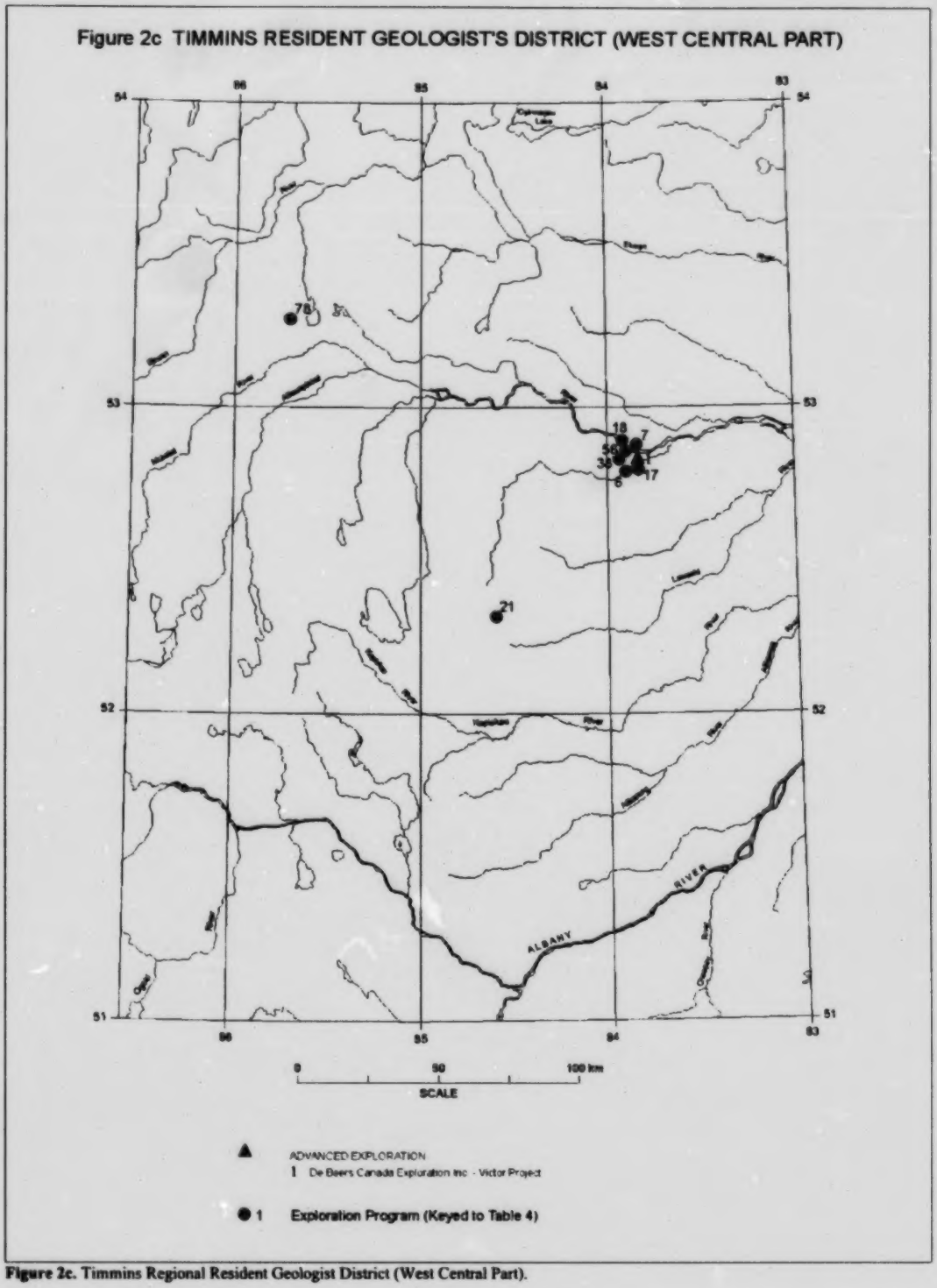

Figure 2c. Timmins Regional Resident Geologist District (West Central Part).

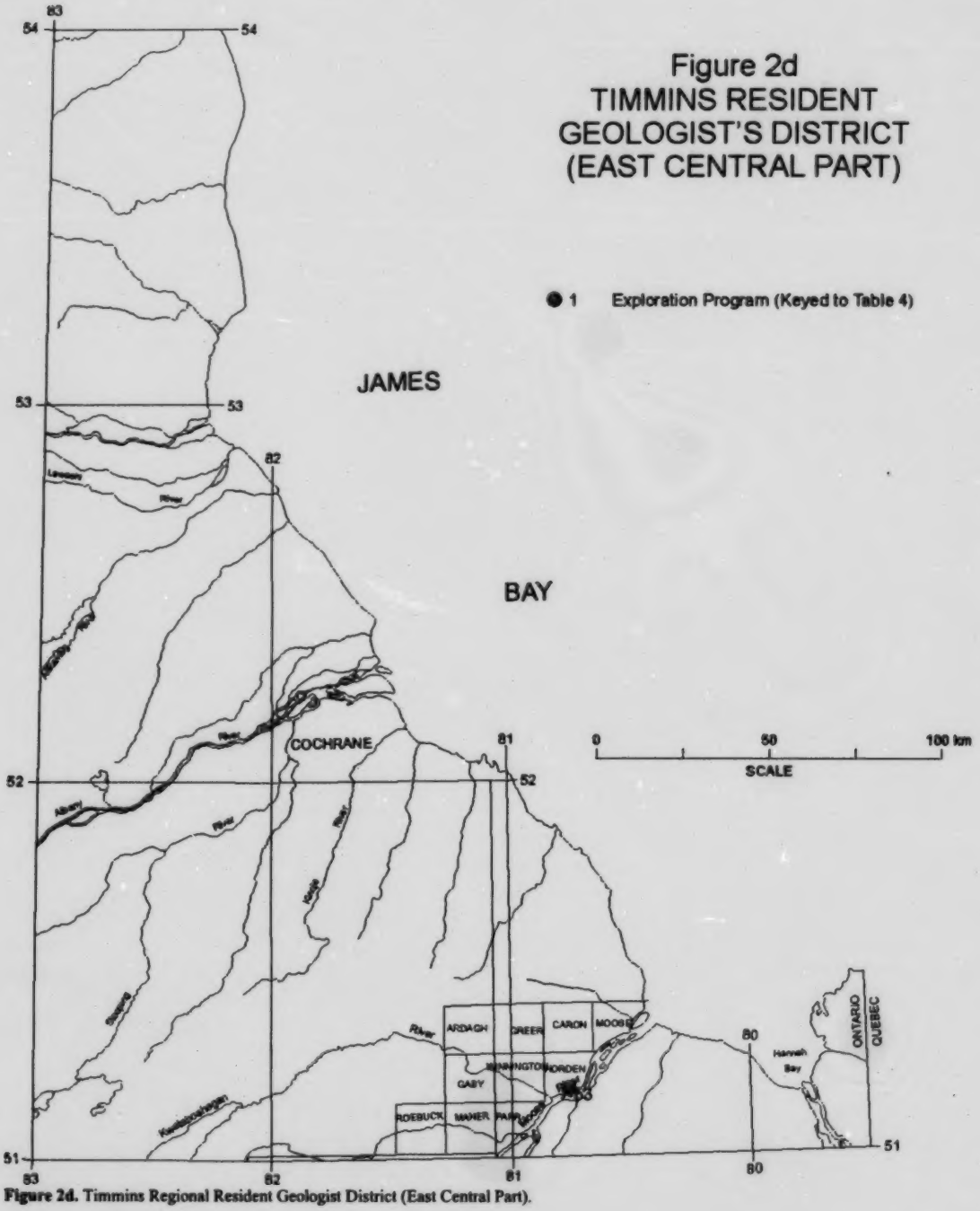

Figure 2d. Timmins Regional Resident Geologist District (East Central Part).

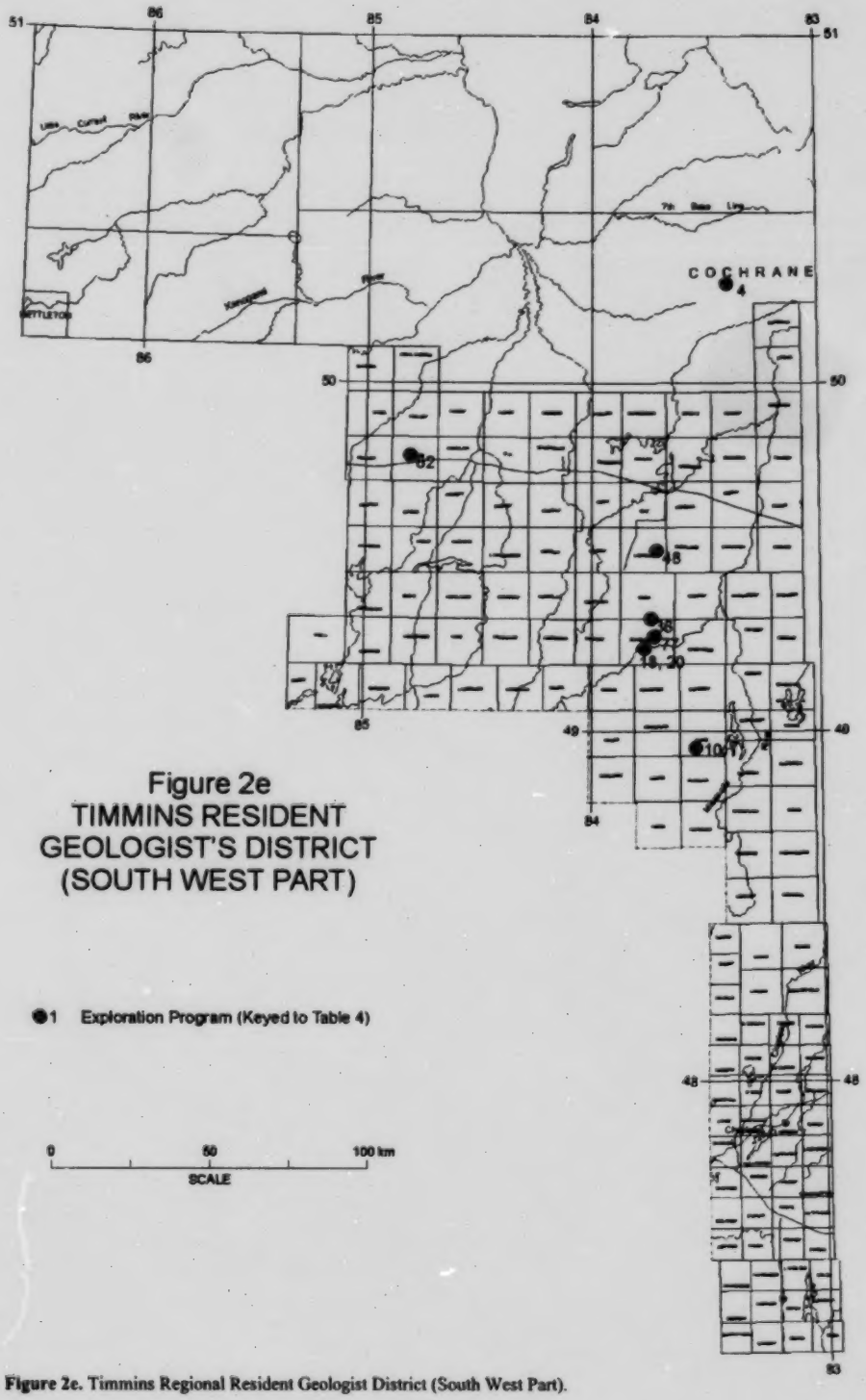

Figure 2e
TIMMINS RESIDENT
GEOLOGIST'S DISTRICT
(SOUTH WEST PART)

Figure 2e. Timmins Regional Resident Geologist District (South West Part).

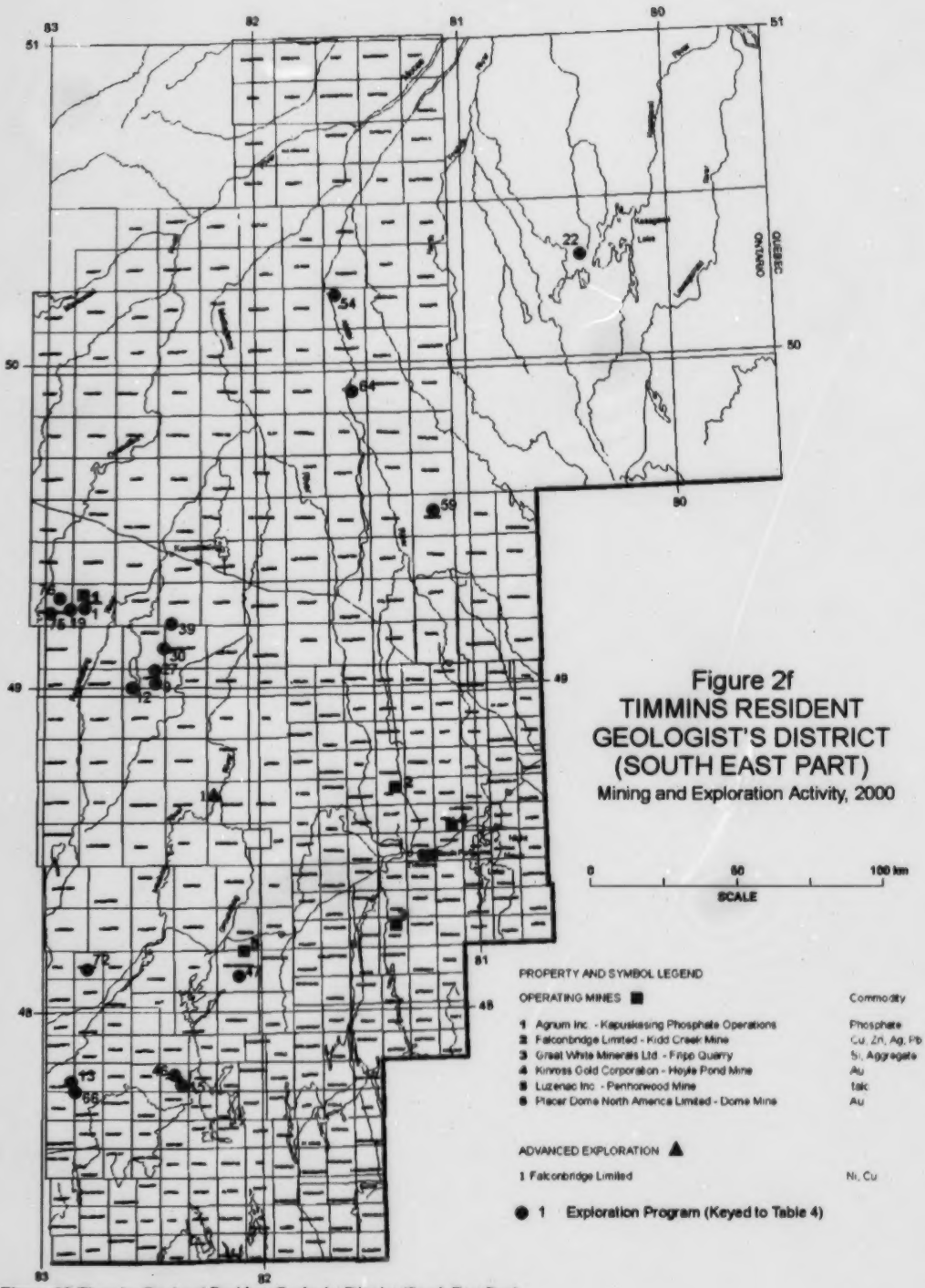
Figure 2f
TIMMINS RESIDENT
GEOLOGIST'S DISTRICT
(SOUTH EAST PART)
Mining and Exploration Activity, 2000
0
50
100 km
SCALE
PROPERTY AND SYMBOL LEGEND
OPERATING MINES
Commodity
1 Agrium Inc. - Kapuskasing Phosphate Operations Phosphate
2 Falconbridge Limited - Kidd Creek Mine Cu, Zn, Ag, Pb
3 Great White Minerals Ltd. - Fripp Quarry Si, Aggregate
4 Kinross Gold Corporation - Hoyle Pond Mine Au
5 Luzenac Inc. - Penhorwood Mine talc
6 Placer Dome North America Limited - Dome Mine Au
ADVANCED EXPLORATION
1 Falconbridge Limited Ni, Cu
1 Exploration Program (Keyed to Table 4)
ONTARIO
QUEBEC

Figure 2f. Timmins Regional Resident Geologist District (South East Part).

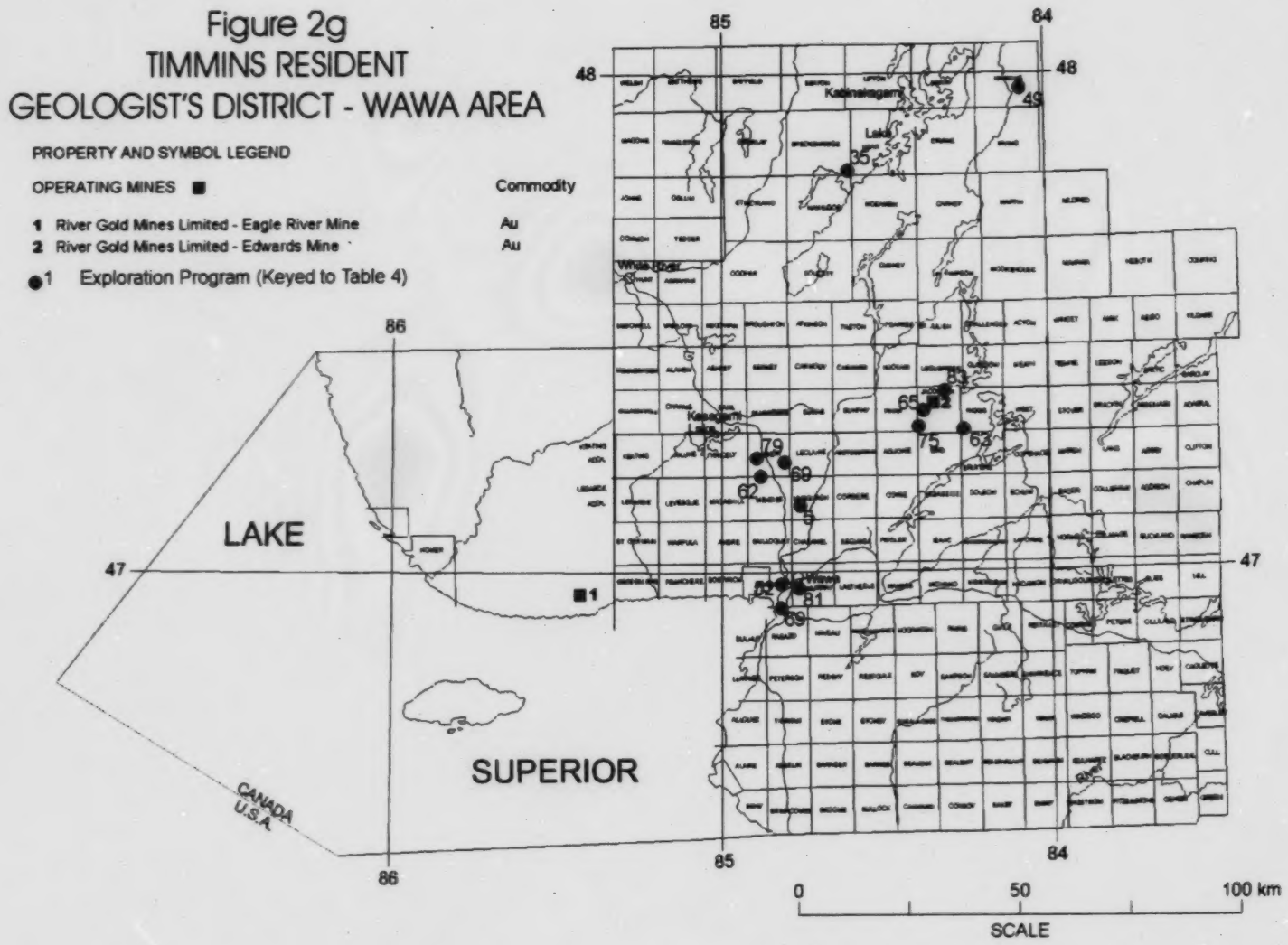

Figure 2g. Timmins Regional Resident Geologist District (Wawa area).

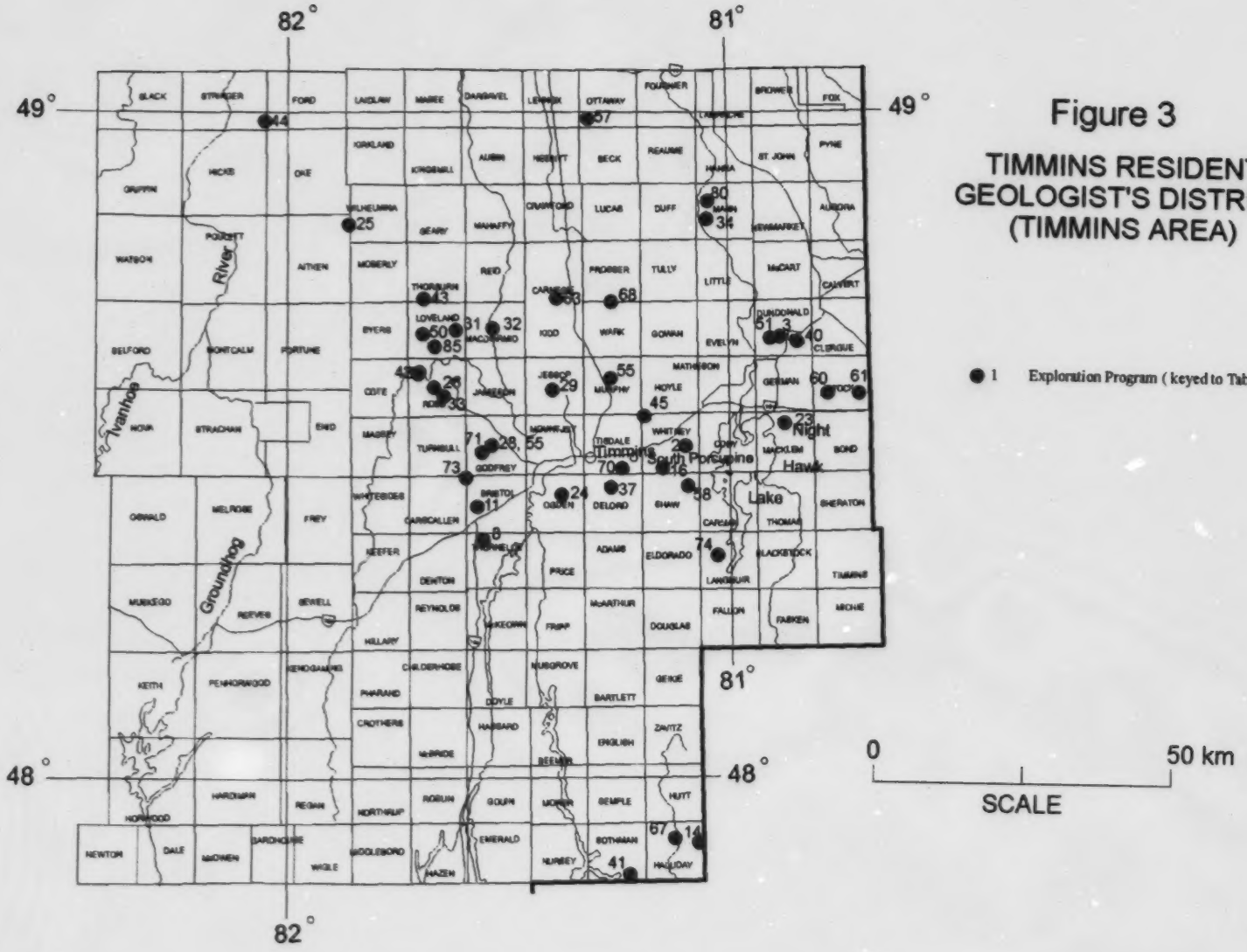

Figure 3. Timmins Regional Resident Geologist District (Timmins Area).

MINING ACTIVITY

In their second full year of production at the Kapuskasing Phosphate Operations, Agrium Inc. significantly improved production of apatite sands for fertilizer.

Gold production continued in Timmins at Placer Dome Inc. – Dome Mine and at Kinross Gold Corporation – Hoyle Pond Mine. In Wawa, River Gold Mines Ltd. continued gold production at the Eagle River Mine.

Falconbridge Limited continued to mine at the Kidd Creek Mine and to mill, smelt and refine ore at the Kidd Metallurgical Complex located in Hoyle Township. Preliminary work is underway to develop deep ore reserves between the 2100 m to 3100 m levels at the mine.

Luzenac Inc. expanded talc production at their Penhorwood Mine, located 80 km west of Timmins in Penhorwood Township. Talc concentrate is trucked from the mine site to their mill in Timmins for processing and microgrinding into various talc products.

Silica production continued from the Fripp Township quarry by Great White Silica Minerals Ltd. and commenced from the Shaw Township quarry operated by Nortem Mining and Exploration Inc.

Base Metal Mining

FALCONBRIDGE LIMITED – KIDD CREEK MINE

Falconbridge Limited - Timmins operations include the Kidd Creek base metal mine and the Kidd Metallurgical Site. Combined, these operations are the largest employer in Timmins. New developments at the Kidd Creek Mine include the deep development project currently in progress to access copper and zinc ore beneath the 6800 foot level. Internal shaft sinking and ramping is in progress and is presently below the 7300 foot level.

As a result of upper mine ground movements during the year, ore production has been reduced by about 20% from the planned mining rate. Production amounted to 1 977 222 tonnes of ore grading 2.38% copper, 5.40% zinc and 61 g/t silver. The daily milling rate was 6030 tonnes.

Ore reserves at year end are:

Category	Tonnes	Copper %	Zinc %	Silver g/t
Proven	14 697 000	2.17	5.85	77
Probable	10 285 000	2.25	6.98	54
Total	24 982 000	2.20	6.32	68

The principle mining method was blast hole open stope with delayed cemented rock fill. Mining was active on 25 levels with 20 active headings and included 9014 m of drifting and 2807 m of raising.

The Kidd Creek Mine employs 605 people and an additional 300 contractors are working on site on the deep development project. The metallurgical operations employ an additional 865 people. D. Gignac is the General Manager of the Mining Division, C. Ferron is the General Manager of the Metallurgical Division and D. Duff is the Chief Geologist (D. Duff, Falconbridge Limited, written communication, 2002).

Gold Mining

KINROSS GOLD CORPORATION – HOYLE POND MINE

Production from the Hoyle Pond Mine was 156 261 ounces of gold from 443 892 tonnes of ore milled. The ore grade was 12.40 grams per tonne and the mill achieved a recovery rate of 88.3%. The daily milling rate was 1216 tonnes.

Ore reserves at the end of 2001 were:

	Tonnes	Grade (Gold g/t)	Ounces
Proven:	366 740	13.31	156 964
Probable:	553 798	14.04	249 948
Total	920 538	13.75	406 912

Underground mining operations included 11 699 m of drifting and 1575 m of raising. Mining was active on 40 headings using longhole (38.2%), shrinkage (13.1%), open pit (9.2%), paste cut and fill (5.7%) and panel mining (3.5%) methods. All mining percentages are based on tonnes mucked. Drilling amounted to 25 083 m for ore definition and 34 320 m of exploration drilling. Open pit mining began late in the year on the 1060 Zone crown pillar to a depth of 30 m and is being operated concurrently with underground mining operations. Underground reserves increased by 10% due to exploration successes in the high grade Upper and Lower Porphyry zones. Access to the Hoyle Pond Mine was re-routed from Florence Street, Porcupine through the Pamour Mine site via Highway 101.

The Hoyle Pond Mine employs 396 people. G. Halverson is the Mine Manager and A. Still is the Chief Geologist.

Regional exploration by Kinross Gold Corporation was carried out on the former Royal Oak Mines Limited properties that Kinross acquired in 1999. Diamond drilling was completed on the McIntyre Central Porphyry Zone (Pearl Lake Porphyry), the Coniaurum mine area and north of the Pamour Mine. Total surface drilling was 7753 m. During the year, Kinross Gold Corporation acquired all the mine and exploration assets of Pentland Firth Ventures Ltd. (A. Still, Kinross Gold Corporation, written communication, 2002).

PLACER DOME (CLA) LIMITED – DOME MINE

At the Dome Mine, in Tisdale Township, gold production amounted to 302 795 ounces gold from 4 543 601 tons milled. The ore grade was 0.075 ounce per ton gold and the daily milling rate was 12 450 tons per day. The mill recovery rate was 89.3%.

Ore reserves at year end were:

	Tons	Grade (ounce per ton)
Proven	12 323 000	0.031
Probable	15 892 000	0.059
Total	28 215 000	0.047

Mining operations included open pit truck and shovel operations, and underground long hole stoping and cut and fill methods. Underground operations totalled 16 705 feet of drifting and 2842 feet of raising while underground drilling included 53 270 feet of ore definition and 119 917 feet of exploration drilling. There were 103 active headings including 22 longhole stopes and 10 cut and fill stopes. Surface exploration drilling totalled 71 802 feet.

Underground exploration continued with a combined total of 173 712 feet of diamond drilling and 1255 feet of exploration development. Surface exploration increased significantly over the previous year on the Dome Mine property and on adjoining Placer Dome owned and optioned properties.

The Dome Mine employs 457 people in the mining and milling operations. C. Seeley is the Acting Mine General Manager and M. Shannon is the Chief Geologist (M. Shannon, Placer Dome (CLA) Limited, written communication, 2002).

RIVER GOLD MINES LTD. – EAGLE RIVER MINE

The Eagle River Mine is located 50 km west of Wawa in unsurveyed territory. The River Gold Mill is located 17 km north of the minesite and all ore is trucked to the mill for gold recovery. The mine includes ramp and decline access in addition to a new shaft that is being sunk to access deeper ore and reduce mining costs. During the year, the shaft deepening project neared completion to a planned depth of 505 m. Existing ramp access to the 400 m level was extended to access development work on the high grade No. 6 Zone. A longitudinal section of the underground mine workings is presented in Figure 4.

As a result of low gold prices throughout the year, production was halted at the Edwards Mine and that operation was placed on care and maintenance.

Gold production for the first nine months of the year amounted to 69 200 ounces from 244 300 tonnes milled for a recovered grade of 8.8 g/t gold. Production for 2000 was 85 100 ounces gold from 331 600 tonnes grading 9.0 g/t gold. The mill recovery was 96% at a daily operating rate of 910 tonnes (River Gold Mines Ltd., Annual Report 2000).

Proven and Probable Reserves at the end of 2000:

Mine	Tonnes	Grade g/t
Eagle River	1 211 000	10.14
Edwards	96 000	11.31

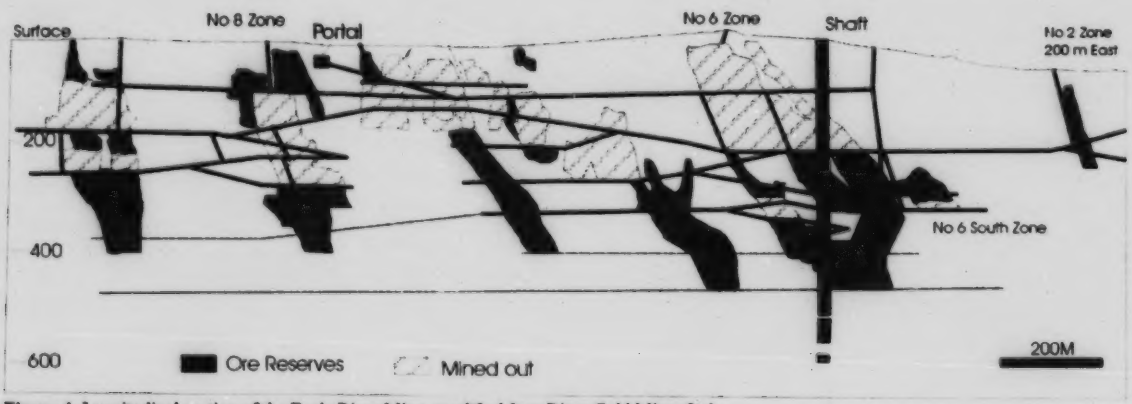

Figure 4. Longitudinal section of the Eagle River Mine, *modified from* River Gold Mines Ltd.

Industrial Mineral Production

AGRIUM INC. – KAPUSKASING PHOSPHATE OPERATIONS

As Canada's only producer of phosphate, Agrium Inc.'s Kapuskasing Phosphate Operations, located 40 km southwest of Kapuskasing, ranks as one of the highest grade phosphate mines in the world. Opened in 1999, the Kapuskasing Phosphate Operations achieved a significant increase in annual production in 2001. Apatite sand is mined from a residual deposit of weathered carbonatite in a conventional open pit, shovel and truck operation. An apatite concentrate is produced on site and shipped by rail to Agrium's Redwater, Alberta fertilizer plant for processing into fertilizer.

Phosphate production amounted to 780 000 tonnes from 1 348 000 tonnes milled at a grade of 33.0% P_2O_5. The mill operated at a daily rate of 5800 tonnes with a recovery of 64% P_2O_5. Proven and probable ore reserves are 18 570 000 tonnes with a grade of 27 % P_2O_5. Surface drilling included 14 351 m for ore definition and 8855 m of exploration drilling.

Site preparation and permitting for a 1.5 km diversion of Lost River to expand the pit operations continued through the year. Mill developments included the installation and commissioning of a new belt filter, and two box magnetic units for improved iron mineral removal. Exploration drilling focused on delineation of Zone A and Zone C orebodies.

Agrium has a workforce of 60 people and an additional 40 contractors work on site. A. Watson is the Mine Manager and R. Pressacco is the Mine Geologist (J. Gagne, Agrium Inc., written communication, 2002).

GREAT WHITE MINERALS LTD. – FRIPP SILICA QUARRY

Great White Minerals Ltd. produced silica from the Fripp Township quarry throughout the year.

LUZENAC INC. – PENHORWOOD MINE

The Penhorwood Mine operates at a rate of 600 tons per day with ore being broken and crushed on a seasonal basis by a mining contractor. The mill processes the talc ore and produces a float concentrate that is shipped to the upgrading and microgrinding facilities in Timmins, on-site of the Hollinger Gold Mine. A Knelson concentrator was added to the mill circuit to improve talc recoveries at the mine. A bulk tank truck specially designed for Luzenac talc operations makes four trips daily from the minesite to the Timmins mill. Luzenac completed the construction of a railway loading siding at Foleyet from which they can load and ship talc products throughout North America.

Production for 2001 amounted to 225 615 tonnes from measured reserves and 91 650 tonnes from indicated reserves for a total of 317 265 tonnes grading 48% talc.

Reserves at the mine to the end of 2001 are:

Proven:	3 251 840 tonnes
Probable:	1 315 342 tonnes
Total:	4 567 182 tonnes @ 48% talc.

Exploration definition drilling for talc amounted to approximately 2400 m in 20 holes. At the current rate of production, the mine has reserves for +14 years. The Penhorwood Mine employs a work force of 21 people and the Timmins milling operations employ 39 people. K. Tyler is the Mine Manager (K. Tyler, Luzenac Inc., personal communication, 2002).

The Penhorwood Mine was brought into production in 1976 by Canadian Johns-Mansville Co. and taken over by Steetly Talc Limited, a division of Steetley PLC in 1978 until acquired by Luzenac Inc. in August 1988.

Geology

The Penhorwood Mine is hosted by a large ultramafic intrusive body that has been completely altered to talc and magnesite. A large, east-trending deformation zone centred on the deposit underlies the open pit. Consequently, the talcose orebody exhibits an intense shear foliation. This structure is subsequently crosscut by a later north-trending fault. To the north of the ultramafic unit, a small outcrop of slaty graphitic sediments outcrop, approximately 100 m north of the mill building. The ores are variably magnetite bearing. Red coloured magnesite, similar to that observed at the Canadian Magnesite deposit in Deloro Township, outcrops in the central east part of the pit. Chrome mica is variably present throughout the alteration zone peripheral to the main talc orebody. Fresh blasted ore has a fairly consistent off white colour. Large radiating tabular crystals of black tourmaline, var. dravite, up to 3 cm long occur with a chrome mica-bearing altered ultramafic rock in the east pit area (Geoscience Laboratories identification, sample 2001 BTA 29).

Table 2. Mine production and reserves in the Timmins District.

Mine	Production in 2001		Production in 2000		Reserves at end of 2001	
	Tonnage @ Grade	Total Commodity	Tonnage @ Grade	Total Commodity	Tonnage	Grade
Falconbridge Limited, Kidd Creek Mine	1 977 222 tonnes @: 2.38% Cu, 5.40% Zn, 61 g/t Ag	105 312 tonnes Zn 47 058 tonnes Cu 3 824 755 oz Ag	2 275 000 tonnes @: 2.49% Cu, 4.5% Zn, 0.11% Pb, 47 g/t Ag	102 375 tonnes Zn 56 648 tonnes Cu 3 437 638 oz Ag	24 982 000 tonnes** incl: proven 14 697 000t probable 10 285 000t	2.20% Cu, 6.32% Zn, g/t Ag
Kinross Gold Corporation, Hoyle Pond Mine	443 892 tonnes @ 12.40 g/t	156 261 oz Au	460 576 tonnes @ 11.27 g/t Au	140 036 oz Au	920 538 tonnes incl: proven 366 740t probable 553 798t	13.75 g/t Au 406 912 ounces
Luzenac Incorporated, Penhorwood Mine	317 265 tonnes @ 48% talc	83 758 tonnes talc	220 018 tons @ 46.9% talc	60 342 tons talc	3 251 840 tonnes proven and 1 315 342 tonnes indicated	48.0% talc
Placer Dome (CLA) Limited - Dome Mine	4 543 601 tons @ 0.075 opt Au	302 795 oz Au	4 667 332 tons @ 0.073 opt Au	313 904 oz Au	28 215 000 tons** incl 12 323 000 tons proven 15 892 000 tons probable *	0.047 opt Au

Notes:
Abbreviations: N/A – Data not available; g/t – grams per tonne; opt – ounces per ton.
* *Proven and probable reserves.*
** *Total of proven, probable and possible reserves.*

Table 3a. Gold production in the Timmins Regional Resident Geologist District to the end of 2001.

Mine Name	Township	In Production	Tons Milled	Oz. Au	Grade*
Ankerite/March	Deloro	1926-1935	317 769	61 039	0.19
Aquarius	Macklem	1984, 1988-89	139 634	27 117	0.19
Aunor Pamour(#3)	Deloro	1940-1984	8 482 174	2 502 214	0.30
Banner	Whitney	1927-28,-33,-35	315	670	0.13
Bell Creek	Hoyle	1987-91, 1992-94	576 017	112 739	0.196
Bonetal	Whitney	1941-51	352 254	51 510	0.15
Bonwhit	Whitney	1951-54	200 555	67 940	0.34
Broulan Porcupine	Whitney	1939-1953	1 146 059	240 660	0.21
Broulan Reef Mine	Whitney	1915-65	2 144 507	498 932	0.23
Buffalo Ankerite	Deloro	1926-53, 78	4 993 929	957 292	0.19
Cincinnati	Deloro	1914, 1922-24	3 200	736	0.23
Concordia	Deloro	1935	230	16	0.07
Coniarum/Carium	Tisdale	1913-18, 1928-61	4 464 006	1 109 574	0.25
Crown	Tisdale	1913-21	226 180	138 330	0.61
Davidson-Tisdale	Tisdale	1918-20,,1988	53 221	2 438	0.26
Delnite	Deloro	1937-64	3 847 364	920 404	0.20
(open pit)		1987-88	56 067	3 602	0.77
DeSantis	Ogden	1933, 39-42, 61-64	196 928	35 842	0.18
Detour Lake	Sunday Lake Area	1983-99	16 005 557	1 781 858	0.111
Dome	Tisdale	1910	84 397 980	14 537 595	0.172
Faymar	Deloro	1940-42	119 181	21 851	0.180
Fuller (Vedron)	Tisdale	1940-44	44 028	6 566	0.15
Gillies Lake	Tisdale	1921-31, 35-37	54 502	15 278	0.28
Goldhawk	Cody	1947	636	53	0.08
(open pit)		1980	40 000	3 967	0.10
Halcrow-Swayze	Halcrow	1935	211	40	0.19
Hallnor (Pamour #2)	Whitney	1938-68, 81	4 226 419	1 690 560	0.40
Hollinger- Schumacher	Tisdale	1915-1918	112 124	27 182	0.24
Hollinger	Tisdale	1910-68	65 778 234	19 327 691	0.29
Pamour Timmins Property		1976-88	2 615 866	182 056	0.07
Hoyle – Falconbridge	Whitney	1941-44,46-49	725 494	71 843	0.10
Hoyle Pond	Hoyle	1985-	4 092 354	1 595 935	0.39
Hugh-Pam	Whitney	1926, 48-65	636 751	119 604	0.19
Jerome	Osway	1941-43, 56	335 060	56 893	0.17
Joburke	Keith	1973-75, 79-81	440 117	43 571	0.10
Kingbridge/Gomak	Chester	1935-36	1 387	98	0.07
Marlhill	Hoyle	1989-91	156 800	30 924	0.199
McIntyre Pamour Schumacher	Tisdale	1912-88	37 634 691	10 751 941	0.29
(ERG Tailings recovery)		1988-89	2 549 189	18 260	
McLaren	Deloro	1933-37	876	201	0.23
Moneta	Tisdale	1938-43	314 829	149 250	0.47
Naybob (Kenilworth)	Ogden	1932-64	304 100	50 731	0.17
Nighthawk	Macklem	1995-99	1 479 607	175 803	0.12
Owl Creek	Hoyle	1981-89	1 984 400	236 880	0.12
Pamour #1 (Incl. pits 3, 4 & 7)Hoyle	Whitney	1936-99	45 795 863	4 078 525	0.09
Pamour (other sources)	Whitney	1936-99	7 416 634	676 645	0.091
Paymaster	Deloro	1915-19, 22-66	5 607 402	1 192 206	0.21
Porcupine Lake (Hunter)	Whitney	1937- 40,- 44	10 821	1 369	0.13
Porcupine Peninsular	Cody	1924-27,-40,-47	99 688	27 354	0.27
Preston	Tisdale	1938-68	6 284 405	1 539 355	0.24
Preston NY	Tisdale	1933	2 800	153	0.05
Preston/Porcupine Pet	Deloro	1914-15	NA	314	
Preston/Porphyry Hill	Deloro	1913-15	46	312	6.78
St. Andrew Goldfields – Stock	Stock	1989-94, 2000	815 429	129 856	0.16
Tionaga/Smith Thorne	Horwood	1938-39	6 653	2 299	0.35
Tisdale Ankerite	Tisdale	1952	14 655	2 236	0.15
Tommy Burns/ Arcadia	Shaw	1917	21	14	0.28
Vipond	Tisdale	1911-41	1 565 218	414 367	0.26
	Total		**318 779 824**	**66 699 994**	**0.209**

* ***Grade: ounce gold per ton***

Table 3b. Base metal production in the Timmins District to the end of 2001.

Mine Name	Township	In Production	Ore Milled	Grades
Alexo	Dundonald	1912-19 1943-44	51 857 tons 4 923 tons	4.5% Ni, 0.55% Cu
Canadian Jamieson	Godfrey	1966-71	816 173 tons	2.44% Cu, 4.22% Zn
Jameland	Jamieson	1969-72	509 356 tons	0.99% Cu, 0.88% Zn
Kam Kotia	Robb	1943-44 1961-72	6.6 Mtons	1.1% Cu, 1.17% Zn, 0.10 oz/T Ag
Kidd Creek	Kidd	1966-	133.952 Mtonnes	2.40% Cu, 6.59% Zn, 0.267% Pb, 82.4 g/t Ag
Langmuir #1	Langmuir	1990-91	111 502 tons	1.74% Ni
Langmuir #2	Langmuir	1972-78	1.1 Mtons	1.43% Ni
McIntyre	Tisdale	1963-82	10 Mtons	0.67% Cu
Redstone	Eldorado	1989-92 1995-96	294 895 tons 10 228 tons	2.4% Ni 1.7% Ni
United Obalski	Godfrey	1966	Produced 240 tons Cu concentrate	

ADVANCED EXPLORATION

Montcalm Cu-Ni Project - Falconbridge Limited

The Montcalm Project is located in Montcalm Township, 85 km northwest of Timmins. A nickel copper deposit with a mineral resource of 7 018 100 tonnes grading 1.46% Ni and 0.71% Cu has been outlined by diamond drilling. To date, approximately 80 000 m of diamond drilling has been completed on the property. This work, combined with underground development work via ramp access, has outlined three structurally defined zones of mineralization within the differentiated and crudely layered mafic to ultramafic Montcalm Gabbroic Complex. Falconbridge acquired the property from Outokumpu Mines Ltd. for $14 million and are completing a pre-feasibility study on the deposit. The pre-feasibility study will include the mining and processing of a large bulk sample.

Victor Project - De Beers Canada Exploration Inc.

De Beers Canada Exploration Inc. completed bulk sampling of approximately 9400 tonnes of diamondiferous kimberlite from the Victor project, located 90 km west of Attawapiskat. Kimberlite material was extracted from two surface trenches and from large diameter (24 inch) drill holes to a depth of 200 m. A 250 tonne per day modular processing mill was erected on site for processing the kimberlite for further evaluation of diamond content. The diamond concentrate was shipped to De Beers' laboratories in Johannesburg, South Africa, for evaluation. Due to an early thaw in the winter of 2000, bulk sampling continued in 2001. For the year, work included drilling of 28 large diameter holes. Other drilling included seven drill holes for geotechnical coring, four holes for delineation drilling, and 25 reverse circulation holes for overburden mapping. One drill hole was completed for hydrological testing (D. Boucher, De Beers Canada Exploration Inc., written communication, 2002). As a result of the bulk sampling program, De Beers has outlined a resource of 36.2 million tonnes of kimberlite with an inferred diamond grade of 0.43 carats per tonne (*The Northern Miner*, December 2001).

Development of a mine in the lowlands raises many issues and concerns. Specifically, the area of the Victor Project is water saturated, overlain by up to 60 m of overburden including glacial till and marine sediments and is very remote with no infrastructure, road access or power. De Beers has completed a desk top feasibility study to evaluate the project's potential of supporting a mining operation. Due to the many issues, a pre-feasibility study will be

carried out over the next two years. Most of the work will be geotechnical to determine the viability of bringing the deposit to a production stage. Figure 5 is a schematic of the Victor kimberlite pipe.

In addition to the Victor project, De Beers did reverse circulation drill testing of several other kimberlites of the Attawapiskat kimberlite cluster. Results of that work are summarized in the Exploration Activities section of this report.

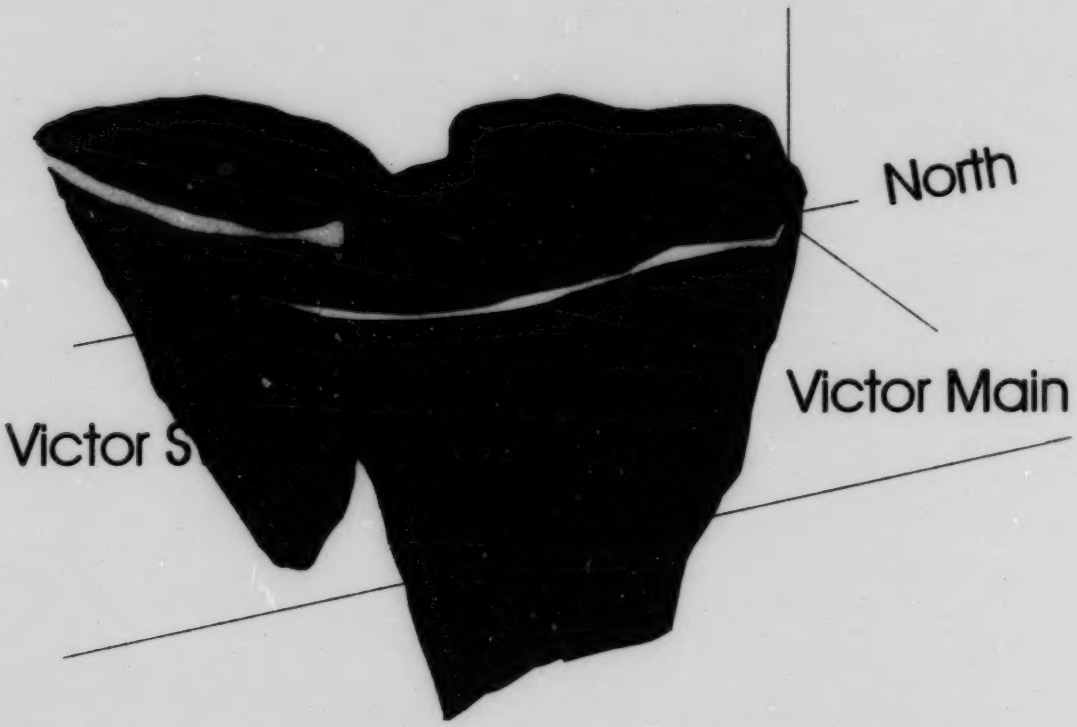

Figure 5. Schematic diagram of the Victor kimberlite pipe illustrating facies variation within the pipe. *Modified from* De Beers Canada Exploration Inc.

Table 4. Exploration activity in the Timmins District in 2001. (Keyed to Figures 2a, 2c, 2d, 2e, 2f, 2g and 3.)

Abbreviations

AEM ..... Airborne electromagnetic survey	GT ..... Geotechnical survey
Au ..... Gold	HLEM ..... Horizontal loop electromagnetic survey
AM ..... Airborne magnetic survey	HM ..... Heavy mineral sampling
ARES ..... Airborne resistivity survey	IM ..... Industrial mineral testing and marketing
Au ..... Gold	IP ..... Induced polarization survey
Beep ..... Beep Mat survey	JV ..... Joint venture
BM ..... Base Metals	Lc ..... Linecutting
Bulk ..... Bulk sampling	MMI ..... Mobile Metal Ion survey
Co ..... Cobalt	Ni ..... Nickel
Comp ..... Data compilation	OD ..... Overburden drilling
Cu ..... Copper	PEM ..... Pulse electromagnetic survey
DD ..... Diamond drilling (Holes) length in metres	PGE ..... Platinum group elements
DGP ..... Down-hole geophysics	Pr ..... Prospecting
GC ..... Geochemical survey	Samp ..... Sampling (other than bulk)
GEM ..... Ground electromagnetic survey	Str ..... Stripping
GL ..... Geological Survey	TEM ..... Transient electromagnetic survey
GM ..... Ground magnetic survey	Tr ..... Trenching
GP ..... Ground geophysical survey	VLFEM ..... Very low frequency electromagnetic survey
GPS ..... Global Positioning System survey	Zn ..... Zinc

No	Company/Individual	Township/Area (Commodity)	Exploration Activity
1	Agrium Inc.	Cargill (Phosphate)	DDH (57) 5230m
2	Anderson, S. D.	Whitney (Au, BM)	IP, Lc
3	Aqualine Resources Inc.	Dundonald (Ni, Cu, PGE)	DDH (2) 135m
4	Baltic Resources Inc./MCK Mining Corp.	South of Ridge Lake (Phosphate)	DDH (12) 1297m, Assays
5	Band-Ore Resources Ltd./ Kennecott Canada Exploration Inc.	Musquash (Diamond)	Str, Tr, Gl, Samp
6	Big Red Diamond Company Ltd.	BMA 527834 (Diamond)	GC
7	Blue Falcon Resources Ltd.	BMA 527834 (Diamond)	GC
8	Bonhomme, J. C.	Thornloe	DDH (1) 30m
9	BRC Development Corporation	Fenton (BM)	DDH (3) 713m
10	Byng Properties Inc.	Byng (Au, BM)	DDH (4) 572m, Assays
11	Cameco Gold Inc.	Bristol (Au)	DDH (3) 1483m, Assays
12	Canabrava Diamond Corporation/ Paramount Ventures & Finance Inc.	Fenton (Diamond)	Assays, GC, GM, Lc
13	Canabrava Diamond Corporation/ Paramount Ventures & Finance Inc.	Kapuskasing Structural Zone (Diamond)	GC, DD
14	Canadian Arrow Mines Limited	Halliday (Au, BM)	IP, Lc, DDH (10) 2016m
15	Claim Lake Resources Limited	Heenan, Marion (Au, BM)	Pr, Samp
16	Crites, J. G.	Whitney (BM, Au)	DDH (1) 182m
17	De Beers Canada Exploration Inc.	BMA 527833, 527834 (Diamond)	Bulk sample drilling (37) 2661.8m, 1458.28 km AEM, 108 387.28 km AM

No	Company/Individual	Township/Area (Commodity)	Exploration Activity
18	Dia Bras Explorations Inc.	Scholfield, BMA 527834 (Diamond)	GC
19	Diadem Resources Ltd.	Cargill, Ecclestone (Diamond, PGM)	GC,
20	Diatreme Explorations Inc.	Scholfield, Talbot (Diamond)	GM, Lc, HLEM
21	Dumont Nickel Inc.	BMA 523843 (Diamond)	DD
22	Eastmain Resources Inc. / Quaterra Resources Inc.	Little Kesagami Lake, Upper Kesagami Lake (Au, Ni, Cu, PGM)	Lc, 67.7km GM, 26km HLEM
23	Echo Bay Mines Ltd.	Macklem (Au)	DDH (3) 599m, 34 km Lc, 30 km IP, GM
24	Echo Bay Mines Ltd.	Ogden (Au)	DDH (3) 768m
25	Explorers Alliance Corporation	Aiten, Wilhelmina (BM)	GM, Lc, PEM
26	Explorers Alliance Corporation	Robb (Zn, Cu, Ag, Au)	IP, DD. GC, Assays
27	Falconbridge Limited	Fenton (BM)	DDH (1) 198m
28	Falconbridge Limited	Godfrey (BM)	DDH (3) 412m
29	Falconbridge Limited	Jessop (BM)	HLEM, Lc, GM
30	Falconbridge Limited	Casselman, Staples (BM)	DD, Assays
31	Falconbridge Limited	Loveland (BM)	DDH (2) 195m
32	Falconbridge Limited	Macdiarmid (BM)	DDH (1) 200m, GM, HLEM, Lc
33	Falconbridge Limited	Robb (BM)	DDH ((1) 279m
34	First Point Minerals Corporation	Mann (PGE, Ni, Cu)	Lc, GM, 13.8 km IP
35	Freewest Resources Canada Inc.	Lizar, Namiegos, Breckenridge (Au)	Pr, Samp, GM, IP, Str, GL
36	Gagne, M. Y.	Ebbs, Scholfield	AM, HM, Samp
37	Globex Mining Enterprises Inc.	Deloro (talc, magnesite)	Samp, GC, DDH (2) 179.6m
38	Goldaur Resources Inc.	BMA 527834 (Diamond)	GC
39	Hinzer, J.	Casselman, Swanson (diamond)	Assays, GC, GM, HM, Lc, Pr, Samp
40	Hucamp Mines Limited	Dundonald, Clergue (PGM, Ni, Cu)	DD, Tr, Samp, Assays
41	Hucamp Mines Limited	Sothman (Ni, Cu, Co, Au, PGM)	Str, Samp, Assays, GM,
42	Huot, J. P.	Robb	Assays, DDH (2) 513m
43	Inco Limited	Thorburn, Moberly, Byers, Loveland (Ni, Cu, PGE)	Lc, 36km PEM, 33km HLEM, DDH (1) 149m
44	Kennecott Canada Inc. / Canabrava Diamond Corporation / Paramount Ventures and Finance Inc. (Rocky Island project)	Ford, Stringer, Oke (diamond)	GM. GEM, Samp
45	Kinross Gold Corporation	Tisdale, Hoyle, Whitney (Au)	Lc, DDH, 7753m, Assays, PEM

No	Company/Individual	Township/Area (Commodity)	Exploration Activity
46	Lashbrook, R.L.	Heenan (Au, BM)	Assays, Pr
47	La société de gestion Maskours	Penhorwood	Comp
48	Lecours, G.	Lowther (Ta, REE)	Pr, Str
49	McKinnon, D.	Hawkins	DDH (2) 214m
50	Meunier, D.	Loveland (Au)	DDH (1) 134m
51	Meunier, D.	Dundonald	DDH (2) 125m, Assays
52	Michipocoten First Nation Cultural Association	Lendrum	Str
53	M. J. Labelle Co. Ltd.	Horden	GT
54	M. J. Labelle Co. Ltd.	Pitt	GM, Lc
55	Moneta Porcupine Mines Inc./ Falconbridge Limited	Godfrey, Murphy	Lc, GEM, DDH (3)
56	Navigator Exploration Corp./ Canabrava Diamond Corporation	BMA 527834 (Diamond)	111km Lc, GM, DDH (19) 2111m, Assays
57	Noranda Inc.	Ottaway (BM)	DD
58	Nortem Mining and Exploration Inc.	Shaw (silica)	Bulk
59	Northern Shield Resources Inc.	Ireland (Diamond)	DD (1) 72m
60	Novawest Resources Inc.	Stock (Au)	Assays, DDH (2) 583m
61	Nufort Resources Inc.	Stock (Au)	GM, Lc, VLFEM
62	Oasis Diamond Exploration Inc.	Lalibert, Menzies (Diamond)	Samp, GL, Str
63	Opawica Explorations Inc.	Carnegie (BM)	DD
64	Opawica Explorations Inc.	Pinard (PGE, Ni, Cu)	Gl, Samp
65	Patricia Mining Corp.	Finan, Jacobson, Rigg, Bruyere (Au, Diamond)	Assays, GL, Samp. Tr, Str, GM, IP, Lc, DDH (5) 1027m
66	Patrie, J. P.	Halcrow	HM, Pr, GM, Lc
67	Pegg, C. and Whelan, R.	Halliday	GC, DDH (1) 250m
68	Pegg, C. and Meunier, D.	Wark, Prosser	GM, VLFEM, GC
69	Pele Mountain Resources Inc.	Lalibert, Lendrum (Diamond)	Bulk
70	Placer Dome Inc.	Tisdale, Deloro (Au)	DD (131) 22 618m, GC, GL, GP, IP
71	Prospectors Alliance Corporation	Godfrey (BM)	AM, AEM, GL, DD, Assays
72	Purechem Limited	Warren (alumina, silica)	Samp. Tr
73	Ripped Canadian Artists Inc.	Bristol, Godfrey, Turnbull	GL
74	Sea Emerald Development Corporation	Langmuir	DD (1) 210m

No	Company/Individual	Township/Area (Commodity)	Exploration Activity
75	Sherwood Capital Ltd.	Finan, Jacobson	Assays, GC, Samp
76	Silverman, G.C.	Eccelstone (Diamond)	Assays, DDH (7) 788m
77	Sirios Resources Inc.	Scholfield (Diamond)	GM
78	Spider Resources Inc. / KWG Resources Inc. (Kyle No. 3 property)	BMA 532854 (Diamond)	Samp, DDH (9) 1985.14m
79	Spider Resources Inc./ KWG Resources Inc.	Lalibert (Diamond)	Samp, Str
80	Tres-Or Resources Ltd.	Duff, Mann (Ni, Cu, PGM, Au)	Samp, DD, GM, HLEM, IP, Assays
81	Tri Origin Exploration Ltd.	McMurray (Au, Diamond)	GL, GP, DD
82	Valerie Gold Resources Ltd.	McCoig (Ni, Cu, PGE)	DDH (4) 610m, IP
83	Ven Can Gold Corporation	Jacobson (Au)	GC
84	Wallbridge Mining Company Limited	BMA 551883 (BM, PGE)	Lc, GM, HLEM, DDH (1) 329m
85	123448 Ontario Inc.	Loveland	Assays, DDH (1) 333m

EXPLORATION ACTIVITY

Active exploration projects underway in the Timmins District in the year 2001 are listed in Table 4 with locations indicated in Figures 2 and 3. Highlights of select projects are described below.

Band-Ore Resources Ltd.

Band-Ore Resources Ltd. recovered numerous diamonds from sampling on the Engagement Zone area of the 39 km^2 GQ property in Musquash Township, 15 km north of Wawa. Included in the diamond count were 340 macrodiamonds greater than 0.5 mm in one dimension obtained from a 406 kg bedrock sample. The largest diamond was 0.254 carats and measured 3.74 mm by 3.30 mm. The property has since been optioned to Kennecott Corporation and additional trenching, sampling and geological mapping was completed. A bulk sample of 930 kg was extracted for diamond testing in Kennecott's diamond laboratory in Thunder Bay, Ontario.

Big Red Diamond Company Limited

Big Red Diamond Company Limited is a private Timmins based company exploring for diamonds in the Attawapiskat area of the James Bay lowlands. The company has staked numerous claims and completed reconnaissance helicopter supported stream and till sampling in the area.

De Beers Canada Exploration Inc. – Attawapiskat Kimberlites

De Beers first explored for diamonds in the James Bay lowlands as early as 1962 when reconnaissance stream sediment sampling was done by two-person parties canoeing and sampling the major rivers of the lowlands. The recovery of kimberlite indicator minerals in the Attawapiskat River led to additional sampling the following year. The 1963 sampling program resulted in the discovery of one diamond weighing approximately 0.05 carats. In 1970, larger sized stream sampling was completed at those sites previously identified with anomalous kimberlite indicator minerals. No diamonds were found and exploration of the area was abandoned. In the mid-1980s, De Beers Canadian exploration division, Monopros Limited, returned to the area for additional exploration. The discovery of a

large kimberlite indicator mineral glacial dispersal train rekindled interest in the area. Subsequent work discovered kimberlite boulders on the bank of the Attawapiskat River in 1987. Airborne magnetic surveys flown over the area identified magnetic anomalies with kimberlite-like patterns in the Paleozoic carbonate rocks of the lowlands. The magnetic features were staked and drill tested in the winter of 1988. Drilling confirmed the magnetic features were kimberlite, but due to the low microdiamond abundance and the chemistry of the indicator minerals, the kimberlite pipes weren't considered high priority targets. No additional work was done until 1995 when the claims were due to expire. Additional analysis of the drill core and microdiamond content of the kimberlite pipes permitted model grade calculations for each pipe (Table 5). Two macrodiamonds were discovered in the drill core including a 0.2 carat diamond from Victor kimberlite and a 0.15 carat diamond from Alpha North kimberlite. Monopros did additional drill testing on Bravo, Victor, Xray and Zulu kimberlites in 1997 using a helicopter portable reverse circulation drill rig. Kimberlite pipe locations are indicated on Figure 6. Thin overburden cover over part of the Victor kimberlite permitted excavation of a surface sample that provided additional sample material for further testing in 1999. The combined results of drill and surface sampling on the Victor indicated bulk sampling was warranted. The Victor project was then designated as advanced exploration with the application to remove a 10 000 tonne bulk sample for additional testing. That work was completed over 2000-2001. During that time, Monopros Limited was renamed De Beers Canada Exploration Inc.

De Beers Canada Exploration Inc. flew a fixed wing airborne magnetic survey of 104 587 km and helicopter magnetic surveys of 3800.28 km in the area of the Attawapiskat kimberlite pipes, located 100 km west of the community of Attawapiskat. De Beers also completed mini bulk sampling of several kimberlite pipes in the vicinity of their advanced development project at the Victor kimberlite. The company has identified a cluster of kimberlite pipes in the Attawapiskat area (Figure 6) and done preliminary work on each, including geophysical surveys and limited drill testing. In concert with advanced exploration on the Victor kimberlite, several of the satellite kimberlite pipes were further evaluated over the last year to assess their macrodiamond content. The program concentrated on the Alpha, Delta, Tango and Whiskey kimberlites. These were selected for testing due to favourable results from limited previous testing. The winter program involved reverse circulation drilling on each of the pipes using a mobile air reverse circulation drill equipped with 4.5 inch diameter, dual walled drill pipe and 5.5 inch or 6 inch diameter Chevron drill bits. A total of 37 reverse circulation drill holes were completed with a combined length of 2661.8 m.

Attributes of the sampled kimberlites and results from the 1995 drill program are presented in Table 5, and the results from the 2001 drill program are listed in Table 6. The data permit a comparison of the calculated model grades of the kimberlite pipes from the microdiamond distribution with the actual grades based on the macrodiamond content of the drill core.

Table 5. Microdiamond model grades of Attawapiskat kimberlite pipes.

Kimberlite Pipe	Size (Hectares)	Mass treated (kg)	Grade carats per hundred tonnes (cpht)
Alpha	7.5	159.5	<1
Alpha North	3.7	312.2	10
Bravo	3.6	73.9	30
Charlie	0.4	160.6	20
Delta	6.4	176.5	5
Gulf	4.0	143.1	<1
India	3.0	147.0	<1
Tango	4.6	159.0	<1
Tango Extension	4.6	142.0	<1
Uniform	1.0	144.2	<1
Victor	15.0	1080.7	10
Whiskey	2.7	1376.1	15
Xray	6.6	197.0	40
Xray 1	1.7	156.8	<1
Yankee	3.8	134.0	<1
Zulu	3.4	192.0	40

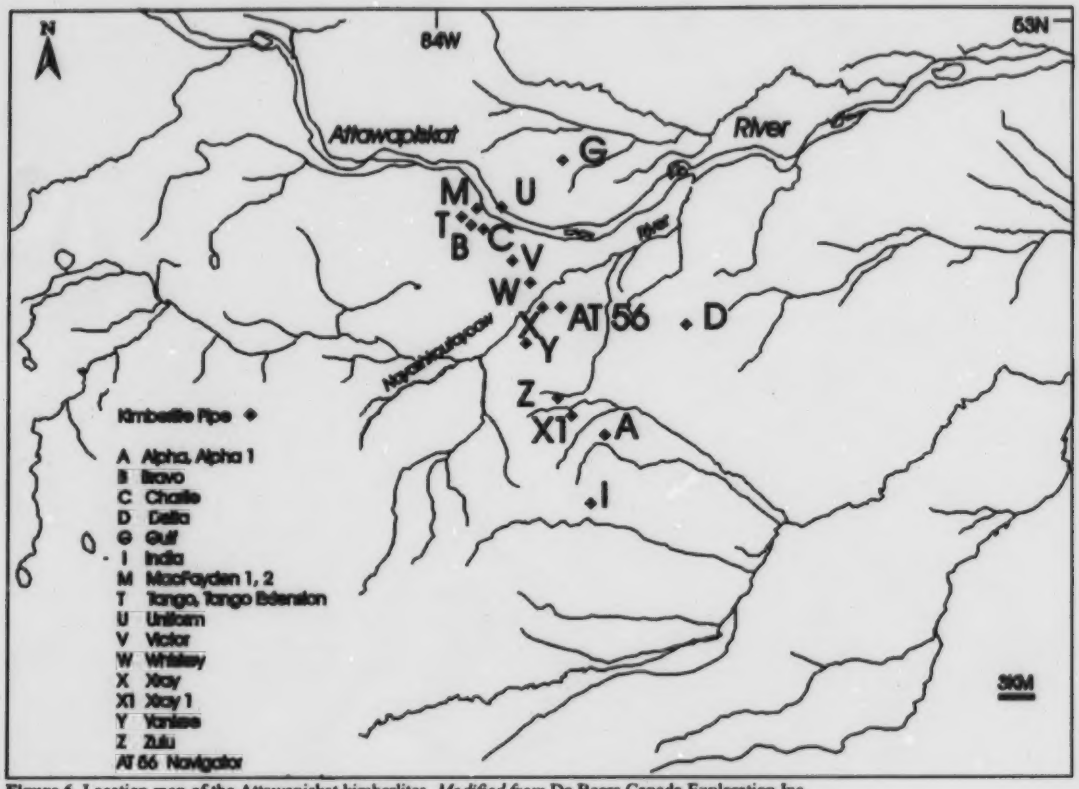

Figure 6. Location map of the Attawapiskat kimberlites. *Modified from* De Beers Canada Exploration Inc.

Table 6. De Beers Canada Exploration Inc. Attawapiskat kimberlite bulk sampling summary 2001.

Kimberlite Pipe	Area Hectares	Pipe Shape	Holes Drilled metres	Dry Sample Weight Tonnes	Macrodiamonds recovered (Number) total weight in carats	Grade carats per hundred tonnes (cpht)	Claims
Alpha	7.5	circle	(9) 589.8	18.61	(14) 0.355	1.8	P1052280, P1052283
Alpha North	3.7	elongate	(4) 253.5	8.32	(0) 0	0	P1052275, P1052276, P1052280
Delta	6.4	elongate	(5) 463.1	20.05	(12) 1.02	5.1	P1052694, P1052695, P1052698, P1052699
Delta North	1.3	elongate	(1) 51	2.05	0	0	P1052694, P1052695
Tango	4.6	polygon	(9) 585.7	15.67	0	0	P1052234
Tango Extension	4.6	polygon	(8) 612.7	14.47	(64) 3.545	24.5	P1227096
Whiskey	2.7	elongate	(1) 106	4.22	(1) 0.02	0.47	P1052713, P1052714

Freewest Resources Canada Inc.

Freewest Resources Canada Inc. has acquired the Lizar property consisting of 450 claims covering approximately 7300 hectares in the western part of the Kabinakagami greenstone belt, located 100 km north of Wawa. The property lies within Namiegos, Lizar and Breckenridge townships. The Hiawatha Mine, a 200 ounce past producing gold mine is located to the immediate northeast. Prospecting and sampling during the year identified several gold bearing showings with high grade gold mineralization. Assays up to 1.21 ounce gold per tonne are reported from the property. Mineralization is hosted by pyritized shear zones in mafic volcanic rocks associated with felsic intrusions. Geological mapping of the Kabinakagmi greenstone belt was completed by Siragusa (1977). Freewest completed geological mapping, magnetic and Induced Polarization surveys as well as stripping, trenching and sampling on the property. As a result of the work, eight new gold discoveries and several base metal targets hosted by felsic volcanic rocks were identified (D. Hoy, Freewest Resources Canada Inc., personal communication, 2002).

Globex Mining Enterprises Inc.

Globex Mining Enterprises Inc. completed 2 diamond drill holes on the magnesite talc deposit, formerly known as Canadian Magnesite in Deloro Township. The drilling was done on claim P850094. The company commissioned a scoping study of the deposit with the aim of bringing it to production as a source for magnesium metal, byproduct talc and silica. Previous work has indicated a resource of 100 million tonnes grading 50% magnesite and 25 to 30% talc (Kretschmar and Kretschmar, 1986).

Hucamp Mines Limited Alexo Mine, Dundonald Township

Detailed geological mapping, stripping, channel sampling and diamond drilling was completed on the Alexo Mine property in Dundonald Township (P. Davis, Hucamp Mines Limited, personal communication, 2002). Trench geology and channel sample results in the vicinity of the Alexo Mine are presented in Figure 7 and Figure 8.

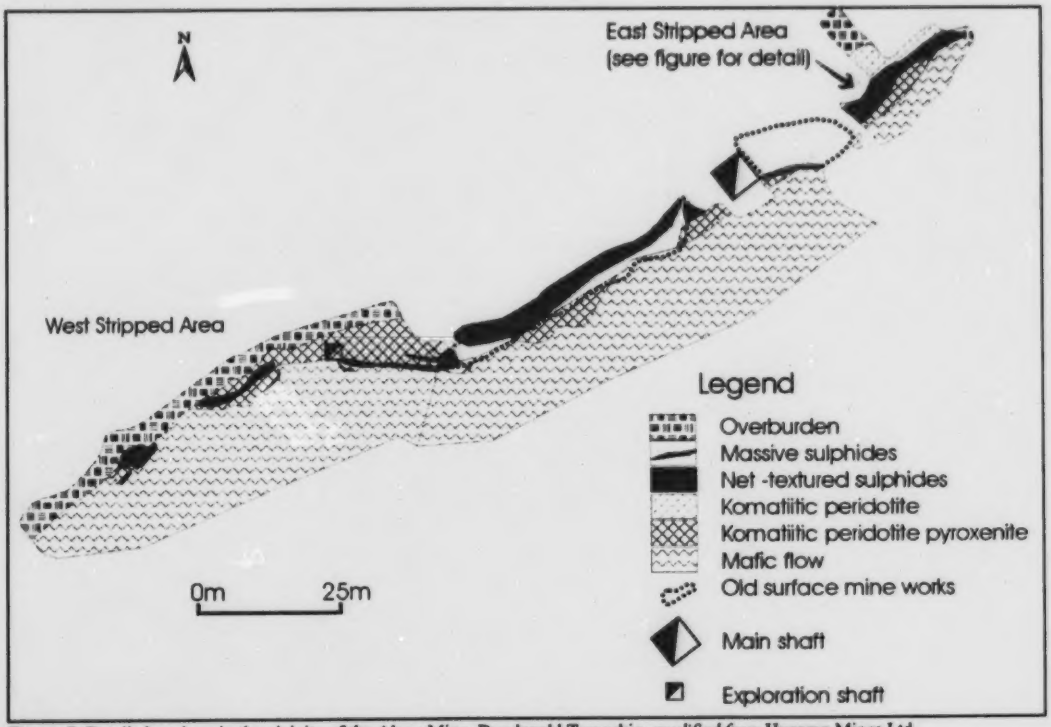

Figure 7. Detailed geology in the vicinity of the Alexo Mine, Dundonald Township, *modified from* Hucamp Mines Ltd.

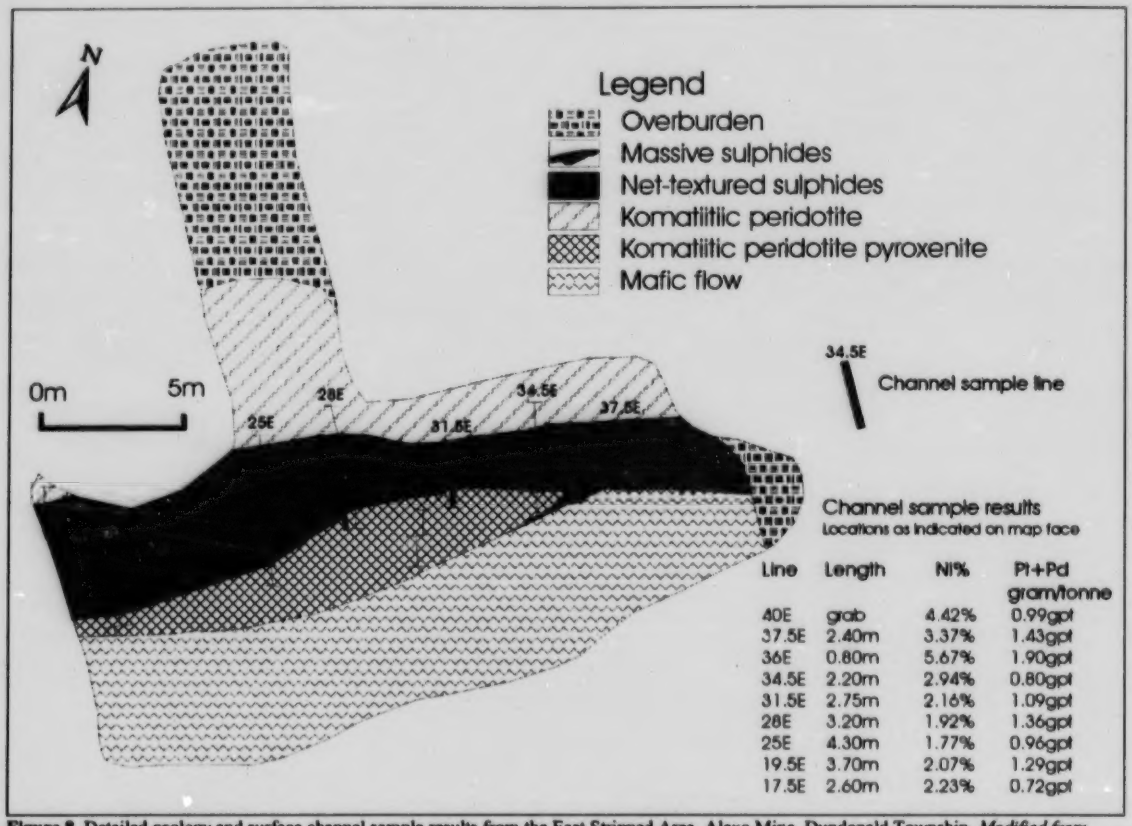

Figure 8. Detailed geology and surface channel sample results from the East Stripped Area, Alexo Mine, Dundonald Township. *Modified from* Hucamp Mines Ltd.

Kennecott Canada Exploration Inc. – Canabrava Diamond Corporation and Paramount Ventures and Finance Inc. – Kap Project

Ground magnetic and electromagnetic surveys were conducted by Kennecott Canada Exploration Inc. over the Kap Central claims. The Kap project consists of 3 claim groups (65 000 ha total) located northeast of Wawa and situated along the western margin of the Kapuskasing Structural Zone. Kennecott is completing work on these properties as part of a 1999 joint venture agreement with Canabrava Diamond Corporation and Paramount Ventures and Finance.

Navigator Exploration Corp – Canabrava Diamond Corporation – Kat Project

Navigator Exploration Corp. and Canabrava Diamond Corporation have acquired 106 claims comprising 20 048 hectares in the area of the De Beers Attawapiskat kimberlite cluster. The companies have completed 20 airborne geophysical grids over select targets in the area and follow-up ground geophysical surveys over ten of these. A number of the targets were drilled, leading to the discovery of the AT-56 kimberlite. The AT-56 kimberlite is located approximately 4 km southeast of the Victor kimberlite pipe. Navigator Exploration Corp. completed nine drill holes to delineate the AT-56 kimberlite. Initial diamond analyses yielded 7 microdiamonds from 274.17 kg of kimberlite. An additional caustic fusion analysis of 2627 kg of kimberlite drill core failed to recover any diamonds greater than

1 mm in two dimensions (macrodiamonds). The AT-56 kimberlite (Figure 6) is located on claim 1243679 and is covered by about 3 m of overburden. The first hole drilled into the kimberlite was vertical and encountered 37 m of kimberlite. Subsequent angled holes drilled into the kimberlite revealed the contacts with the limestone host rock were transitional and serpentinized.

In total, Navigator Exploration Corp. completed 19 diamond drill holes (2111 m) that tested ten targets on the Kat Project. The cost of the work was approximately $1 million. With the exception of AT-56, none of the other targets were kimberlite (K. Armstrong, Navigator Exploration Corp., written communication, 2002).

Oasis Diamond Exploration Inc.

Oasis Diamond Exploration Inc. acquired claims covering 150 km^2 in nine townships in the Wawa area. The most concentrated exploration to date has been on the claims in Lalibert and Menzies townships, referred to as the Enigma Property where the company has completed geological mapping, stripping and rock chip sampling. Oasis reported the presence of diamondiferous volcaniclastic rocks including fine grained crystal tuff, medium grained epiclastic rocks and coarse heterolithic breccia. Caustic fusion analysis of approximately 100 kg of rock chip samples have yielded 37 diamonds, four of which are greater than 0.5 mm in one dimension (J. Buckle, Oasis Diamond Exploration Inc., written communication, 2002).

Patricia Mining Corp.

Patricia Mining Corp. holds the Island Gold Project located in Finan, Jacobson, Riggs and Dunphy townships, located 50 km northeast of Wawa. The project covers 123 patented and leased mining claims and includes the Kremzar Mine, and the Island Lochalsh Zone; both have underground ramp access. The Kremzar Mine was a past gold producer with a proven and probable resource of 181 944 tonnes grading 6.27 g/t gold. A 650 tonne per day carbon-in-pulp mill is on site. The Island Lochalsh Zone has measured and indicated resources of 408 000 tonnes grading 6.6 g/t gold and an inferred resource of 470 000 tonnes at similar grade.

Geophysical surveying over the North Shear and Goudreau Lake deformation zones on the property included 20.5 km of magnetic surveys and 10.8 km of Induced Polarization surveys. Geological mapping was also completed and 88 rock samples collected returned results ranging from nil to 1.54 g/t gold. Diamond drilling on the North Shear Zone in Finan Township included five holes of NQ core totalling 1027 m. All holes reportedly intersected visible gold mineralization.

On the Little Brothers Creek property in the southwest part of Riggs Township, one diamond drill hole totalling 50 m was completed on the Tracanelli occurrence. This hole tested the eastern extension of the Sunday veins and intersected pillowed to massive mafic volcanic rocks with a zone of sericite and silica alteration that assayed 2.26 g/t gold over 2.5 m (R. Sutcliffe, Patricia Mining Corp., written communication, 2002).

Pele Mountain Resources Inc.

Pele Mountain Resources Inc. holds the 101 km^2 Festival property, located immediately north of Band-Ore Resources Ltd. GQ property, 15 km north of Wawa. Pele Mountain extracted a 100 tonne bulk sample of diamondiferous ultramafic volcanic rocks from the Cristal Archean volcanic complex that was processed by De Beers Inc. in their processing laboratory in Johannesburg, South Africa. The bulk sample yielded 96 diamonds with a total weight of 2.31 carats. The largest diamond weighed 0.18 carats (Pele Mountain Resources Inc. press release February 14, 2001).

Purchem Limited

In preparation for bulk sampling, Purchem Limited blasted a surface trench in an outcrop of anorthosite on claims 97441 and 97442 in Warren Township, located approximately 110 km southwest of Timmins. The property is underlain by the extensive Shawmere anorthosite that intrudes the Kapuskasing Structural Zone. Samples collected

from the blast were analysed and results are reported in assessment files. Additional geochemical analyses are presented in Veldhuyzen (1995). Southern African Minerals Corporation has optioned the property from Purchem Limited and can acquire a 100% interest in the property by funding a bulk sampling program over the next three years.

Spider Resources Inc. – KWG Resources Inc.

The Kyle #3 kimberlite is located approximately 220 km west of Attawapiskat and 120 km west of the Victor project. Spider Resources Inc. and joint venture partner KWG Resources Inc. completed an eight hole (1985.14 m) diamond drilling program on the Kyle #3 kimberlite in 2001. Drilling was done from east to west on 100 m sections to a depth of 200 m. To date, Spider and KWG have completed 3577.95 m of drilling on the Kyle #3.

Work continued on the Sandor diamondiferous lamprophyre dike occurrence (Sage 2000) in Lalibert Township near Wawa. Spider and KWG have extended the known length of the dike to 75 m by stripping to the east of the Highway 17 outcrop. The Sandor dike and several new dikes were sampled to assess their diamond content.

Spider Resources Inc. staked additional claims over the Fishtrap Lake gabbroic intrusion at Highbank Lake to investigate the platinum group element potential of the intrusion (N. Novak, Spider Resources Inc., personal communication, 2002).

Tri Origin Exploration Ltd.

Tri Origin Exploration Ltd. holds 172 mining claims covering approximately 2345 hectares in McMurray Township near Wawa. The company has an option to earn a 51% interest in the property from Citadel Gold Mines Inc. and Citabar Limited Partnership. The claim group hosts several historical mines including the Surluga Mine, Cooper Mine, Minto Mine, Parkhill Mine and Grace Darwin Mine. Together, these mines produced over 120 000 ounces of gold at an average grade of 0.26 ounce per ton gold. Recent exploration has identified kimberlite dikes on the property and a six diamond drill hole program totalling 789 m was completed following 40 km of detailed magnetic and induced polarization surveys. All six holes intersected kimberlite dikes of variable thickness. Dike samples contained coarse olivine and phlogophite in a groundmass of olivine, phlogophite, diopside, calcite, dolomite, and oxide minerals including chromite with atoll texture, i.e., hollow-centred porphyroblasts (R. Valliant, Tri Origin Exploration Ltd., written communication, 2002).

Wallbridge Mining Company Limited

Wallbridge Mining Company Limited completed linecutting, magnetic and electromagnetic ground surveys over a block of claims at the confluence of the Roxanne and Severn rivers in the Hudson Bay Lowlands. The company acquired the claims and drilled one hole to test the geology beneath the Paleozoic cover rocks for potential mineralization. Drilling encountered 75 m of overburden including bog and alluvium marine sediments, 2 m of till and 200 m of limestone then a 2 m thick intersection of quartz arenite at the unconformity with the underlying Proterozoic rocks. The Proterozoic rocks consisted of banded chert and magnetite iron formation with minor sulphides (D. Hunter, Wallbridge Mining Company Limited, personal communication, 2002).

RESIDENT GEOLOGIST PROGRAM STAFF AND ACTIVITIES

The Timmins Resident Geologist Office was staffed by B.T. Atkinson, Regional Resident Geologist, A.C. Wilson and G.Wm. Seim, District Geologists, and P. Hope, District Support Geologist. J. Godin and R. Hutchinson were employed under the Summer Experience Program 2001 as summer students.

Much staff time was dedicated to the development of the process to evaluate Provincially Significant Mineral Potential (PSMP). The results of that work will be used to evalute areas of provincially significant mineral potential within the Province of Ontario as part of the Ontario Living Legacy strategy.

The Timmins office also serves as the head office for the Northeast Ontario Regional Resident Geologist Program. J. Ireland is the Regional Manager of the Northeastern Ontario Resident Geologist Program and F. Boucher and D. Egerland are the Administrative Assistants, D.M. Draper is the Regional Support Geologist and G. Yule is the Regional Land Use Geologist for Northeastern Ontario.

Table 7. Summary of staff activities, Timmins Regional Resident Geologist Office, 1998 – 2001.

Activity	1998	1999	2000	2001
Assessment files received (including donations)	269	255	244	230
Client visits - Office	2706	1884	1526	1550
Client visits - Drill Core Library	133	28	64	40
ERLIS client sessions (non-staff)	187	102	69	50
Geological tours given	6	7	13	9
Geoscience library additions (reports; papers; maps)	299	526*	226	235
Property visits by staff	72	73	73	46
Telephone inquiries	3387	2908	2509	2200
MDI records ADDED		161	170	273
MDI records UPDATED	41	921	493	373
MDI records DELETED		20	117	33

* *Elevated figure reflects addition of Wawa technical papers and theses to Timmins RRGO library.*

PROPERTY EXAMINATIONS

G. Ross Property, Horwood Township

G. Ross and partners hold a large block of unpatented mining claims in central Horwood Township. Claims include 1238355, 1236867, 1238353 and 1238354, 1236528, 1236586, 1226249, 1181481, 1181482 and 1189736. Work done on these claims has been partly funded by Ontario Prospectors Assistance Program in 1999. Access to the claims is via the Kenogaming road that leads south from Highway 101W, approximately 70 km west of Timmins. The claims adjoin claims held by G. Windsor and F. Ross that were previously visited and described (Atkinson et al, 2000). Horwood Township was mapped by Breaks (1978).

Previous work on the G. Ross property includes the following:

1947:	Lafontaine Group did diamond drilling of three holes totaling 1501 feet.
1951-1964:	Horlak Mines Ltd. explored the ground.
1963:	Queensway Mines Ltd. diamond drilled twenty two holes amounting to 4422 feet.
1972:	Hollinger Gold Mines Ltd. completed geological surveys, assaying and diamond drilling on the west part of the property.
1974:	Noranda Exploration Company Ltd. did magnetic and electromagnetic surveys.
1980:	Northgate Explorations Ltd. completed magnetic, electromagnetic and soil sampling surveys combined with geological mapping, trenching and sampling.
1990:	Haddington Resources Limited did geophysical surveys, diamond drilled ten holes totaling 1795m, and completed geological surveys.
1999:	G. Ross completed assaying, prospecting, sampling and stripping.

During the property examination, a number of outcrops were examined and sampled. Outcrop locations described below are shown on Figure 9. Results of samples collected are listed in Table 8. All assays and mineral identification of sample 2001 BTA 17 were done by the Geoscience Laboratories, Sudbury, Ontario.

Stop 1: Outcrops of mafic volcanic flows intruded by 1.5 m wide quartz + feldspar dike/sill trending 120° and dipping 35°North. On either side of the dike, small rusty shears are intruded by narrow quartz veins. The upper shear is mineralized with pyrite and a small pod of magnetite occurs. Above the upper shear, the mafic intrusive rock is fine grained green to black in colour and mineralized with 1% disseminated pyrite, chalcopyrite and pyrrhotite. The top of the outcrop consists of mafic volcanic flows that are vesicular and include hyaloclastite and 2 to 3 cm patches of pegmatitic gabbro. A drill hole casing pipe oriented 190°/45°S is located at the upper edge on the roadside outcrop. The next outcrop to the north consists of pillowed mafic volcanic flows. Westward along the road from the first stop, mafic volcanic flows are intruded by veinlets of albite suggestive of proximity to a felsic intrusion.

Stop 2: Horwood Peninsula Pluton gold occurrence.

The Horwood Peninsula Pluton consists of medium grained biotite granodiorite with foliation trending 030°. Foliation parallel quartz + iron carbonate veining occurs within the pluton over an exposed strike length of 120 m. Quartz veins in the granodiorite (Figure 10) carry fine to coarse grained disseminated pyrite that reportedly assay up to two ounce per ton gold. Three samples collected from this site (2001-BTA 10, 2001-BTA 11 and 2001-BTA 12) assayed between 2280 and 37,700 ppb Au.

Stop 3: Outcrop of biotite granodiorite with a 10 m xenolith block of iron carbonate altered ultramafic volcanic flow with quartz veining, pyrite and green mica alteration. The xenolith (Figure 11) is strongly foliated and has sharp contacts with the enclosing granodiorite. This ultramafic xenolith provides evidence of ultramafic volcanic flows in the area even though none are mapped or exposed at surface.

Stop 4: Horpen showing.

This stop is located east of the Horwood Peninsula Pluton and west of Hardiman Bay of Horwood Lake. Several airborne electromagnetic anomalies in the area were drilled by Haddington Resources Ltd. George Ross has completed stripping on the occurrence. Overburden consists of glaciofluvial sand that varied in thickness between 1 to 3 m. The trenched outcrop consists of deformed mafic volcanic flows with patchy discontinuous zones of sulphide mineralization, quartz and hematite. Small blue quartz veins mineralized with pyrite, pyrrhotite, and chalcopyrite occur within the most altered zones and these reportedly carry gold. Pale green radiating tremolite-actinolite crystals up to 2 cm long occur intergrown with the blue quartz veins in silicified, sulphide bearing mafic volcanic flows. Sulphides include pyrite, pyrrhotite, chalcopyrite and sphalerite. The alteration zone trends 075° with an exposed width of 2 m.

Table 8. Results of samples from the G. Ross property, Horwood Township. (ND = Not determined.)

Sample No	Location	Gold (ppb)	Pt (ppb)	Pd (ppb)	Sample Description
2001 BTA 05	Stop 1	8.17			Mafic volcanic flow
2001 BTA 06	"	ND			Quartz porphyry
2001 BTA 07	"	>1000*			Granodiorite
2001 BTA 08	"	98.99	ND	ND	Biotitic mafic flow
2001 BTA 09	"	373.55	ND	ND	Pyroxene gabbro
2001 BTA 10	Stop 2	>1000*			Quartz vein in granodiorite
2001 BTA 11	"	>1000*			Quartz vein in granodiorite
2001 BTA 12	"	>1000*			Quartz vein in granodiorite
2001 BTA 13	Stop 3	41.18			Altered peridotite
2001 BTA 14	"	20.15			Fuchsite bearing xenolith

Sample No	Location	Gold (ppb)	Pt (ppb)	Pd (ppb)	Sample Description
2001 BTA 15	"	ND			Biotitic xenolith
2001 BTA 16	"	471.67			Silicified mafic flow

** These samples were above the working range for gold analysis by induced coupled plasma (ICP) finish and were redone using gravimetric method with the following results:*

Sample No	*Gold (ppb) (Gravimetric method)*	*Gold (ppb) (ICP Finish)*
2001 BTA 07	*6100 and 12700*	*6455*
2001 BTA 10	*6500 and 4800*	*2280*
2001 BTA 11	*11300 and 2700*	*6288*
2001 BTA 12	*23300 and 37700*	*6290*

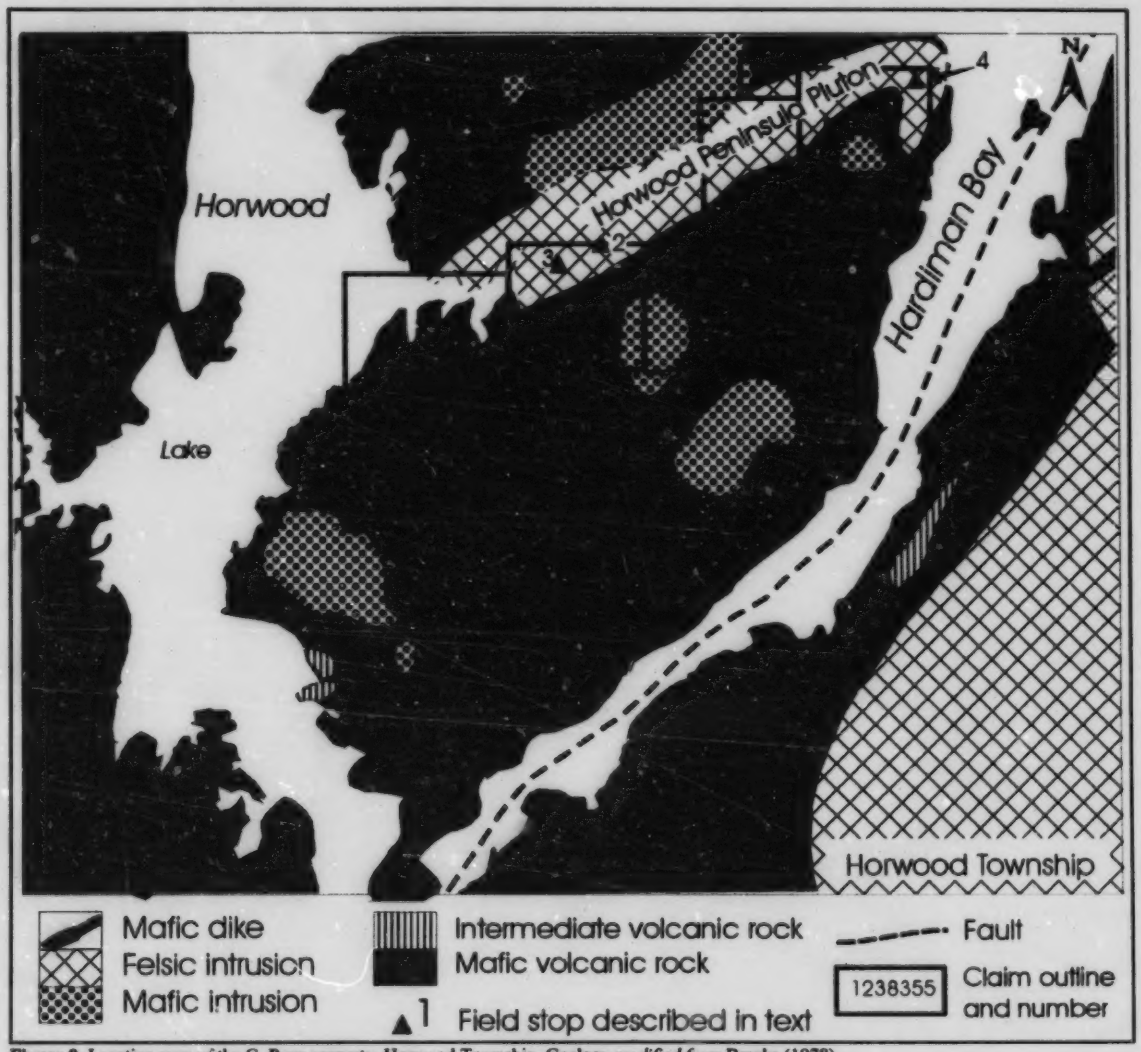

Figure 9. Location map of the G. Ross property, Horwood Township. Geology *modified from* **Breaks (1978).**

Figure 10. Gold-bearing silicified breccia vein in granodiorite, Horwood Lake stock, G. Ross property, Horwood Township. Hammer is 32 cm long. This rock assayed up to 37,700 ppb Au.

Figure 11. Xenolith of foliated, iron carbonate altered ultramafic flow in granodiorite, G. Ross property, Horwood Township. Hammer is 32 cm long.

Sample 2001 BTA 17 was collected for mineral identification from Stop 4. The specimen contains radiating crystals of tremolite - actinolite up to 2 cm long intergrown with feldspar and 3% pyrrhotite. Fragments of blocky fine grained mafic rock in the specimen are occasionally rimmed with a coarse blue sulphide mineral in 3 to 4 mm wide contact aureoles.

At the laboratory, each mineral was picked from the hand sample to prepare a smear mount for X-ray powder diffraction analysis (XRD). A fraction of each mineral was then analyzed by energy dispersive X-ray analysis (EDS) using the scanning electron microscope to determine the elements present. Each mineral identification was made using data from both the XRD and the EDS. The green acicular mineral was positively identified as actinolite. The sulphide mineral was identified as either sphalerite (ZnS) or wurtzite (ZnS). Iron was also detected in the mineral. The mineral is black, the blue colour is the result of surface tarnish (L. Semenyna, Geoscience Laboratories, Sudbury, Ontario, written communication, 2002).

Wurtzite is the rare form of zinc sulphide and it crystallizes in high temperature environments. This is consistent with the mineral assemblage seen on the property in the vicinity of the Horpen showing.

Although no ultramafic rocks are mapped in the area, the presence of the large xenolith of iron carbonate altered ultramafic composition within the Horwood Peninsula Pluton is evidence that such rocks probably occur at depth. The presence of iron carbonate alteration within the xenolith identifies a favourable gold environment.

Woman River Iron Formation - R. Lashbrook and A. MacDonnell Property, Heenan Township

R. Lashbrook and A. MacDonnell have staked 37 claim units covering part of the Woman River Iron Formation in southeast Heenan Township, southwest Marion Township and northeast Benton Township. The property includes iron, base metal and gold prospects.

Access is by way of the Heenan Road that branches northeast off the Dore Road. The Dore Road can be reached via the Foleyet timber road, east of Foleyet from Highway 101 or by way of the Sultan industrial road west off Highway 144. Much of the property has been recently logged so numerous trails provide access throughout the claim group.

The Woman River Iron Formation received exploration attention as early as 1906 for iron ore and a number of deposits have been identified along strike. Falconbridge Limited completed geophysical surveys and soil sampling over parts of the property and identified numerous areas with anomalous gold. Several of these have been diamond drilled. R. Lashbrook and A. MacDonnell completed additional work and limited diamond drilling of select parts of the property.

Geology:

Northeast trending ironstone defines the north limb of an anticlinal structure (Woman River anticline) with a north-northeast trending fold axis. Coring the anticline is a thick sequence of felsic to intermediate volcanic rocks including pyroclastic breccias, lapilli tuff and ash tuff (Figure 12). The felsic volcanic sequence is intruded by fine grained, hematite altered felsic dikes. The ironstone outcrops as a perimeter border of the Woman River anticline and consists of magnetite, hematite, jasper and chert with lesser amounts of sulphidized ironstone intermixed with black argillaceous, pyritic sediments (Figure 13). The ironstone is thinly bedded, attains a thickness of 20 m and is further thickened by fold structures. Numerous trenches have been excavated within the ironstone, particularly where sulphides are present.

Figure 12. Sulphide-bearing felsic pyroclastic breccia of the Strata Lake Formation, Lashbrook MacDonnell property, Heenan Township.

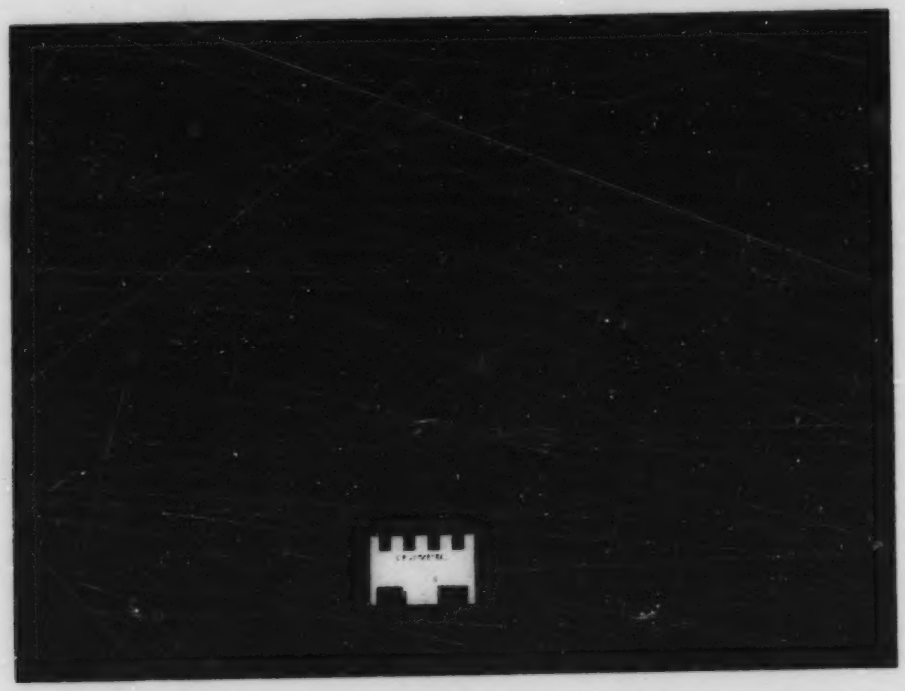

Figure 13. Folded, sulphidized jasperoidal ironstone of the Woman River Formation, Lashbrook MacDonnell property, Heenan Township.

Overlying the ironstone, pillowed, vesicular and variolitic mafic flows with varying degrees of carbonate and chlorite alteration occur. Using the stratigraphic sequence and geochronology of Heather and Shore (1999), the felsic volcanic rocks comprise the Strata Lake Formation of the Marion Group, dated at 2729 ±5 Ma, and the ironstone cap is the Woman River Formation, also part of the Marion Group. The overlying mafic volcanic rocks comprise the October Lake Formation of the Trailbreaker Group dated at 2705 ±2 MA. The felsic dikes are an intrusive event contemporaneous with the deposition of the Trailbreaker Group.

A number of representative rock samples were collected from the property during the site visit; sample descriptions and results are presented in Table 9. Sample locations are indicated in Figure 14.

Table 9. Sample results from the Lashbrook MacDonnell Property, Heenan Township.

Sample Number	Location	Assay Gold ppb (ounce/ton)	Sample Description
2001 BTA 94	Stop 1	465.18	silicified chert ironstone
2001 BTA 95*	"	>1000 (0.06)	chert with 3 to 5% pyrite
2001 BTA 96	"	18.82	fine grained silicified felsic fragmental
2001 BTA 97	"	817.50	jasperoidal chert with 1% pyrite and quartz veining
2001 BTA 98*	"	>1000 (0.16)	jasperoidal chert with 1% pyrite
2001 BTA 99	"	12.13	chert with pyrite and tourmaline
2001 BTA 100	Stop 2	792.87	quartz + epidote + hematite + pyrite felsic pyroclastic
2001 BTA 101*	Stop 3	>1000 (0.15)	carbonate altered mafic pillowed flow

* *These samples were above the working range for gold by ICP Finish (IAT-200) and were redone using gravimetric method, with results stated in ounce per ton.*

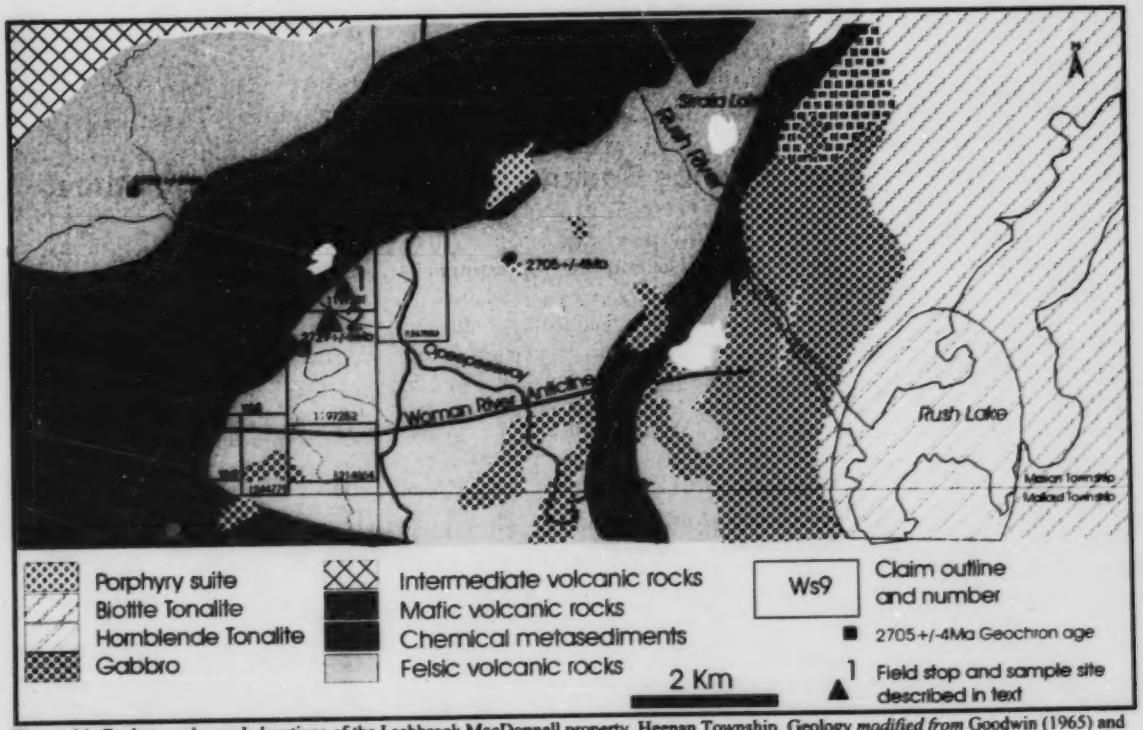

Figure 14. Geology and sample locations of the Lashbrook MacDonnell property, Heenan Township. Geology *modified from* Goodwin (1965) and Heather and Shore (1999).

Windsor - Ross Property, Chewitt Township

Timmins Prospectors G. Windsor and F. Ross staked a block of claims in the Kapuskasing Structural Zone to cover interesting boulders and outcrops of exotic mineral bearing rock. Subsequent to their staking, a detailed airborne magnetic survey flown over the Kapuskasing structural zone identified circular magnetic targets on the claim group. Coincident indicator mineral surveys identified a G10 garnet and other kimberlite indicator minerals in till samples. On the claim group, several large boulders up to 1.5 m in diameter have been found. The boulders and nearby flat lying outcrop are lamprophyre (melnoite?) composition with large xenocrysts of 1 cm sized brilliant green diopside, 5 cm laths of very compact brown phlogophite, 3 cm crystals of black amphibole and crustal xenoliths in a dark brown fine grained matrix. A mineralogical analysis from one boulder identified biotite, calcite, orthopyroxene and a titanian aluminian clinopyroxene as major constituents. Minor mineral phases included pyrite, apatite and albite with accessory actinolite, ferroactinolite, barite and barium calcium carbonate (benstonite, alstonite or barytoclacite). Mineralogical analysis was done by Geoscience Laboratories (Sudbury) using X-ray powder diffraction analysis and scanning electron microscope confirmation. The chemical analysis of the sample (1999 BTA 02) is presented in Table 10. The boulder sampled was very similar to the adjacent outcrop.

Table 10. Major oxide analysis of sample 1999 BTA 02 from Windsor Ross property, Chewitt Township.

Element	Weight %
SiO_2	40.36
Al_2O_3	11.30
MnO	0.02
MgO	10.84
CaO	12.59
Na_2O	4.31
K_2O	3.23
P_2O_5	0.96
TiO_2	1.49
Fe_2O_3	10.23
LOI	3.69
Total	99.20

RECOMMENDATIONS FOR EXPLORATION

Quetico – Abitibi Subprovince Boundary and Rare Metal Pegmatites

The Quetico – Abitibi subprovince boundary is a poorly defined, poorly exposed east trending structural zone that juxtaposes metavolcanic rocks of the Abitibi greenstone belt against amphibolitized metasedimentary rocks of the Quetico subprovince. The contact between these subprovinces is a favourable site for rare metal pegmatite emplacement and is possibly a deep mantle tapping structure that could control emplacement of kimberlite. Several rare metal pegmatites hosted by S-type granites and metasedimentary rocks of the Quetico subprovince occur proximal to the subprovince boundary. In Lowther Township, albite-spodumene pegmatite occurs south of Hearst and the Case pegmatite in Steele Township north of Lake Abitibi hosts elevated tantalum mineralization. Such pegmatites almost always occur in swarms so the vicinity around known pegmatites offers prospective ground for additional rare metal pegmatites.

The nature of the contact between the subprovinces is unknown. The configuration and distribution of greenstone in the Timmins to Cochrane area, at Casa Barardi and at Detour Lake suggest a possible folded contact that accounts for the S-fold distribution of greenstone northward from Cochrane. However, airborne geophysical surveys and limited diamond drilling by Eastmain Resources Ltd. and other companies west of the Detour Lake and north of Cochrane suggest the Abitibi greenstone belt continues westward beneath the claybelt that obscures much of the geology north of Lake Abitibi. Deep penetrating seismic surveys across the subprovince boundary would provide useful insight into the nature and actual location of the Quetico – Abitibi subprovince boundary. Such knowledge could then be applied to assist in the search for rare metal pegmatites along the subprovince boundary.

Diamonds

Ontario's first confirmed report of diamonds in bedrock is documented in 1909 by Provincial Geologist Willet Green Miller (Gibson, 1914). The discovery is from Reaume Township, southwest of Cochrane in the Porcupine District. Since that report, several review papers in the geological literature have challenged the validity of the discovery, citing other works, in particular, a doctoral thesis by Szetu (1954).

In his thesis, Szetu states:

" (A) In Canada, diamonds have been reported found by R. A. A. Johnson in chromite or chrome iron ores from three localities (Poitevin, 1918):

1. Olivine Mountain, Tulameen district, British Columbia (Camsell 1911)
2. Black Lake, Quebec (Dresser, 1913)
3. Porcupine, Ontario (Gibson, 1914)

The discoveries were made by dissolving the chromite and examining the residue. The evidence used for proof of diamond was the fluorescence of the small octahedral crystals after exposure to radium emanation. According to Camsell (1911), Dr. G. F. Kunz has confirmed the discovery in British Columbia. However, no x-ray examination has been recorded.

... Diamonds found in Ontario and Quebec are said to be transparent octahedral crystals. However, it is conceivable that all the transparent minerals are possible phosphor bases (Smith 1945), and Johnson's microscopic size diamonds have not been proved by x-ray investigation. Therefore, it is not considered by the present writer that the evidence given by Johnson regarding the last two named localities is conclusive."

The Reaume Township diamond occurrence has been verified by W.G. Miller. Ultramafic rocks of the Superior craton are proving to be fertile sources of diamonds as demonstrated by the recent discoveries at Wawa and Kyle Lake in the James Bay lowlands. Reaume Township lies within the northwest trending diamond corridor that extends from Timiskaming to Attawapiskat. The presence of diamonds in ultramafic rocks in Reaume Township, as confirmed by W.G. Miller is additional evidence for the prospectivity of the northwest trending corridor for diamonds.

Detailed sampling of the Attawapiskat kimberlites (Sage 2000) indicates a variable chemistry and mineralogy between pipes and within individual pipes. Microdiamond predictions of macrodiamond content of the kimberlites has proven equally challenging as indicated by results of De Beers Canada Exploration Inc. The complexity and variability of kimberlite composition and diamond distribution throughout individual kimberlites should be borne in mind when kimberlites are sampled. Only large samples can give reliable results of the diamond content of kimberlite.

In comparison to other kimberlite provinces, the Attawapiskat kimberlite cluster is relatively small in size. This may simply be the result of limited exploration and discovery to date. The James Bay and Hudson Bay lowlands present ideal target areas for the discovery of additional kimberlites. Much of the geology of the Hudson Bay basin consists of carbonate sedimentary rocks with very low magnetic response. In contrast, the kimberlites that intrude these rocks have significantly elevated magnetic characteristics that result in classic "bull's eye" circular targets that can be identified in detailed airborne magnetic surveys. Much of the Hudson Bay and James Bay lowlands are covered in a veneer of unconsolidated Quaternary marine sediments and till that attain thickness up to 60 m. Paleokarst features identified in the carbonate rocks are infilled with the Quaternary sediments with resultant complex magnetic patterns. Such features could be mistaken for kimberlite on the basis of magnetic interpretation only. However, pre-existing karst features might play a role in kimberlite emplacement, and as such, reconstruction of the paleoenvironment of the lowlands may prove useful in narrowing the search for new kimberlite pipes.

To explore in the James Bay and Hudson Bay lowlands is extremely expensive and beyond the resources of most Prospectors. In contrast, the initial success of diamond discoveries in the Wawa area, and indications of diamondiferous kimberlite in the Kapuskasing Structural Zone present opportunities for effective, low budget prospecting programs. Kimberlite indicator mineral surveys, (Ontario Geological Survey, 2000, 2001) combined with airborne high resolution magnetic surveys over the Kapuskasing structural zone opens up a highly prospective, road accessible area for diamond exploration.

Useful additional references and literature on diamonds and kimberlite material are compiled in Sage and Gareau (2001).

OGS ACTIVITIES AND RESEARCH BY OTHERS

A number of mapping and research projects were underway or completed in the Timmins District and are listed below. Details of the projects are reported in Summary of Field Work and Other Activities 2001 (Baker et. al, 2001).

L. Hall, Precambrian Section, Ontario Geological Survey completed 1:20 000 scale geological mapping of Carscallen and Denton townships.

K. Bazilevskaya (Pennsylvania State University) collected samples of banded iron formation from the Timmins and Wawa area for petrological and geochemical research. This work, in collaboration with H. Ohmoto has the objective of testing the premise of Archean Earth atmospheric composition.

Operation Treasure Hunt

Operation Treasure Hunt is a three year, $29 million initiative funded through the Ontario Ministry of Northern Development and Mines with the objective of enhancing the geoscience database of the Province. A number of projects funded through this initiative include the following in the Timmins District:

In the James Bay lowlands, regional river and stream sampling for heavy mineral and kimberlite indicator mineral surveys were completed in the Attawapiskat River and Albany River drainage basins. This collaborative project was contracted to private industry who in turn used members from the First Nations communities of Attawapiskat, Kashechewan and Fort Albany. Over 1100 samples weighing approximately 15 kg each were collected for multi-element analysis and mineral examination.

In the Coral Rapids area, the collection of modern alluvium sampling was completed and results published. A total of seven G10 garnets (garnets with diamondiferous kimberlite affinity) were identified. As well, numerous volcanogenic massive sulphide mineral indicator grains were recovered. Similar work covered the Chapleau, Foleyet and Kapuskasing - Fraserdale areas (Ontario Geological Survey, 2000; Ontario Geological Survey, 2001).

ACKNOWLEDGEMENTS

Information on past activities reported in the text are from assessment files and other files of the Timmins Resident Geologist Office unless otherwise noted. Information on current mining and exploration activities has been provided by Prospectors and company personnel, and compiled from assessment files and public information sources.

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Table 11. Assessment files received for the Timmins District in 2001.

Abbreviations

AEM ..... Airborne electromagnetic survey	HM ..... Heavy mineral sampling
AM ..... Airborne magnetic survey	IM ..... Industrial mineral testing and marketing
AVLF ..... Airborne very low frequency electromagnetic survey	IP ..... Induced polarization survey
Beep ..... Beep Mat Survey	Lc ..... Linecutting
Bl ..... Blasting	NOHFC ..... Northern Ontario Heritage Fund Corporation
Bulk ..... Bulk sampling	OD ..... Overburden drilling
Comp ..... Compilation	OP ..... Ontario Prospectors Assistance Program
DD ..... Diamond drilling	PEM ..... Pulse electromagnetic survey
DGP ..... Down-hole geophysics	Pr ..... Prospecting
GC ..... Geochemical survey	Samp ..... Sampling (other than bulk)
GL ..... Geological survey	Str ..... Stripping
GM ..... Ground magnetic survey	TEM ..... Transient electromagnetic survey
GT ..... Geotechnical survey	Tr ..... Trenching
HLEM ..... Horizontal loop electromagnetic survey	VLFEM ..... Very low frequency electromagnetic survey

Township or Area	Company Name	Year	Type of Work	AFRO Number	Resident Geologist Office File
Aitken et al. (31 townships)	Prospectors Alliance Corporation	1999	Comp	Donation	T-4516
Aitken, Wilhelmina	Explorers Alliance Corporation	2000-2001	GM, Lc, PEM	2.20869	T-4554
Aitken, Wilhelmina	Explorers Alliance Corporation	2000	GM, Lc, PEM	2.20790	T-4555
Aitken, Wilhelmina	Explorers Alliance Corporation	2001	GM, PEM	2.20958	T-4563
Auden	McGale, J.	1947-1948	Comp	Donation	T-4615
Avon	Fekete, M.A.	2000	GM, IP	OP99-502	T-4549
Benton, Garnet	Lashbrook, R.L.	1999-2000	Assays, GC, GL, Pr, Samp, Str, Tr	OP99-290	T-4544
BMA 524 852	KWG Resources Inc.	1996	HM	2.21460	T-4593
BMA 524 852	KWG Resources Inc.	1996	HM	2.21465	T-4594
BMA 527 834	De Beers Canada Exploration Inc.	2000	Assays, GC, Samp	2.20703	T-4509
BMA 528 834	De Beers Canada Exploration Inc.	2000	Assays, GC, Samp	2.20696	T-4510
BMA 528 834	De Beers Canada Exploration Inc.	2000	GM	2.20866	T-4566
Bourinot	Dia Bras Exploration Inc.	2000	HM, Samp	2.20966	T-4561
Bristol	Cameco Corporation	2000	Assays, DD - 4 - 1006m	2.20762	T-4493
Bristol	Cameco Corporation	2000	IP	2.20856	T-4514
Bristol et al. (6 townships)	Falconbridge Limited	2000	AEM, AM	2.21079	T-4587
Bristol, Godfrey	Explorers Alliance Corporation	2000	DGP	2.20732	T-4521
Bristol, Godfrey, Turnbull	Ripped Canada Artists Inc.	2001	GL	2.21742	T-4604
Brower	Haire, P.G.	1999-2000	Assays, GL, Pr	2.21001	T-4572
Byers et al. (4 townships)	Lalonde, D.J.	2000	GC, Pr	2.20605	T-4503
Byng	Byng Properties Inc.	2001	Assays, DD - 4 - 572m	2.22125	T-4625
Caithness	Silverman, G.C.	1999	HM	2.20991	T-4534
Caithness	Silverman, G.C.	2001	GM, VLFEM	2.21031	T-4535
Caithness	Silverman, G.C.	1999	HM, Samp	2.21011	T-4560
Caithness	Silverman, G.C.	2001	AM, AVLF	2.21020	T-4580
Caithness	Silverman, G.C.	2001	AM, AVLF	2.21902	T-4583
Calder	Valliere, M.	1999-2000	Assays, DD - 5 - 262ft, Str	2.20661	T-4517
Cargill	Viridian Inc.	2001	DD - 57 - 5230m	2.21969	T-4608
Cargill, Ecclestone	Silverman, G.C.	2000	Assays, HM, Pr, Samp	2.20647	T-4511

Township or Area	Company Name	Year	Type of Work	AFRO Number	Resident Geologist Office File
Carscallen	Explorers Alliance Corporation	1999	DGP	2.20731	T-4520
Casselman	Falconbridge Limited	2001	Assays, DD - 1 - 150m	2.21025	T-4526
Casselman	Falconbridge Limited	2001	Assays, DD - 1 - 162m	2.21029	T-4527
Casselman	Falconbridge Limited	2001	DD - 1 - 151m	2.21023	T-4528
Casselman, Staples	Falconbridge Limited	2000	Assays, DD - 2 - 303m	2.20854	T-4504
Casselman, Swanson	Hinzer, J.	2000-2001	Assays, GC, GM, HM, Lc, Pr, Samp	2.21595	T-4626
Chester	Young-Shannon Gold Mines, Limited	2000	Samp, Tr	2.20369	T-4570
Côté, Loveland, Robb	Falconbridge Limited	1999	Assays, GC, Samp	2.20838	T-4564
Cunningham, Greenlaw, Swayze	The Lake Superior Corporation	1909-1910	Assays, Comp, GL, Pr	Donation	T-4614
Deloro	Globex Mining Enterprises Inc.	2000	DD - 2 - 163m	2.20791	T-4500
Deloro	Globex Mining Enterprises Inc.	2001	Assays, DD - 2 - 180m	2.22239	T-4639
Deloro	Ontex Resources Limited	2000	GM, HLEM, Lc	2.21018	T-4599
Denton	Explorers Alliance Corporation	2000	Assays, DD - 2 - 537m	2.20800	T-4495
Denton, Keefer	Galata, F.	1999-2000	Assays, GL, HLEM, Lc, Str	OP99-409	T-4550
Duff, Mann	East West Resource Corporation	2001	IP, Lc	2.21664	T-4619
Dundonald	Falconbridge Limited	2000	GM, Lc	2.21000	T-4567
Dundonald	Meunier, D.	2001	Assays, DD - 2 - 125m	2.21040	T-4552
Dundonald	Meunier, D.	2000	Lc, TEM	2.21039	T-4592
Ebbs	Diatreme Explorations Inc.	1999	GM, Lc	2.21505	T-4595
Ebbs, Scholfield	Fournier, G.	2000-2001	AM, HM, Samp	2.21047	T-4576
Ecclestone	Silverman, G.C.	2000	GC	2.20648	T-4513
Ecclestone	Silverman, G.C.	2001	Assays, DD - 7 - 877m,	2.21033	T-4589
Fenton	BRC Development Corporation	2000	Assays, HM, OD - 35 - 740m, Tr	2.20900	T-4556
Fenton	Canabrava Diamond Corporation	2001	Assays, GC, GM, Lc	2.21578	T-4643
Fenton	Falconbridge Limited	2000	Assays, DD - 2 - 217m	2.20855	T-4506
Fenton	Falconbridge Limited	2000	Assays, DD - 1 - 174m	2.20843	T-4507
Fenton	Falconbridge Limited	2001	DD - 1 - 198m	2.21027	T-4530
Fox River	Diatreme Explorations Inc.	2001	GM	2.21976	T-4610
Fripp	Cool, K.S.	1999	Assays, GL, Lc, Pr, Samp, Str	OP99-487	T-4548
Fripp	Great White Minerals Ltd.	1992-1993	Bl, Comp, IM, Samp	NOHFC 7078	T-4623
Garnet	Mortimer, C.H.	2000	DD - 2 - 55m	2.21354	T-4577

Township or Area	Company Name	Year	Type of Work	AFRO Number	Resident Geologist Office File
Garnet	Mortimer, C.H.	2000-2001	DD - 1 - 180m	2.21679	T-4600
Garvey	Morgan, J.H.	2000	Samp	2.20741	T-4523
German	Salo, R.W.	2000	Assays, DD - 1 - 596ft	OP99-233	T-4539
Godfrey	Falconbridge Limited	2000-2001	GM, HLEM, Lc	2.20936	T-4525
Godfrey	Falconbridge Limited	2001	DD - 1 - 30m	2.22099	T-4628
Godfrey	Falconbridge Limited	2001	Assays, DD - 1 - 87m	2.22004	T-4629
Godfrey	Falconbridge Limited	2000	Assays	2.22142	T-4634
Godfrey	Falconbridge Limited	2001	Assays, DD - 1 - 295m, DGP	2.22219	T-4636
Godfrey	Moneta Porcupine Mines Inc.	2001	Assays, DD - 1 - 252m	2.21804	T-4606
Godfrey	Prospectors Alliance Corporation	2001	Assays, DD - 8 - 410m	2.21558	T-4598
Godfrey	Sims, W.	1999	Assays, DD - 1 - 294m, Lc, PEM	OP99-048	T-4537
Greenlaw	Tims, A.A.B.	1999	Assays, GC, GL, Pr, Samp, Str	OP99-340	T-4545
Halcrow	Patrie, J.P.	2001	HM, Pr	2.21659	T-4631
Halcrow	Patrie, J.P.	2001	GM, Lc	2.21660	T-4632
Halliday	Canadian Arrow Mines Limited	2000-2001	IP, Lc	2.20954	T-4522
Heenan, Marion	Archibald, G.M.	1999	Assays, GL, Pr, Samp	OP99-020	T-4536
Horden	M.J. Labelle Co. Ltd.	2001	GT	2.21397	T-4578
Horwood	Durham, R.B.	1999	Assays, Samp, Str, Tr	2.20568	T-4494
Horwood	Ross, George	1999	Assays, Pr, Samp, Str	OP99-486	T-4547
Horwood	Windsor, G.F.	1999	Assays, Beep, Pr, Samp, Str	OP99-243	T-4540
Hoyle	Black Hawk Mining Inc.	1995	Comp	NOHFC 70361	T-4622
Hoyle	Karpovitch, E.	1980	Comp	Donation	T-4498
Hoyle	Rio Alto Explorations Limited	1981	Comp	Donation	T-4499
Huffman	Gagne, M.Y.	1999-2000	Assays, DD - 5 - 709m	2.21585	T-4597
Huffman	Gagne, M.Y.	2001	Pr, Tr	2.21971	T-4633
Hutt	Falconbridge Limited	2000	GM, Lc, TEM	2.21427	T-4582
Hutt	Falconbridge Limited	2000	PEM	2.21428	T-4603
Hutt, Semple	Robert, J.	1999	Assays, Pr, Samp, Str, Tr	OP99-347	T-4546
Ireland	Northern Shield Resources Inc.	2000	GM	2.22346	T-4644
Jessop	Falconbridge Limited	2001	GM, HLEM, Lc	2.21901	T-4611
Langmuir	Sea Emerald Development Corporation	2001	DD - 1 - 210m	2.21511	T-4618
Langmuir	Sea Emerald Development Corporation	2001	DD - 4 - 447m	2.21677	T-4621

Township or Area	Company Name	Year	Type of Work	AFRO Number	Resident Geologist Office File
Little Kesagami Lake, Upper Kesagami Lake	Eastmain Resources Inc.	1999-2001	AEM, AM, GM, HLEM, Lc, PEM	2.21432	T-4590
Loveland	1232448 Ontario Inc.	2001	Assays, DD - 1 - 333m	2.21759	T-4605
Loveland	Barnes, R.T.J.	2000	GL, Samp, Str	2.20836	T-4569
Loveland	Falconbridge Limited	2000	Assays, DD - 1 - 279m	2.20805	T-4501
Loveland	Falconbridge Limited	2000-2001	Assays, DD - 2 - 195m	2.21060	T-4557
Loveland	Meunier, D.	1999-2000	AEM, AM, DGP, GM,	2.20616	T-4502
Loveland	Meunier, D.	1999	AEM, AM, DD - 1 - 560m, DGP, Str, VLFEM	OP99-137; OP99-138; OP99-139	T-4538
Loveland	Meunier, D.	1996	GM, IP, Lc, VLFEM	2.20792	T-4562
Loveland	Meunier, D.	2000	Lc, VLFEM	2.21738	T-4607
Loveland	Meunier, D.	2001	DD - 1 - 134m	2.21882	T-4609
Lucas	Falconbridge Limited	2000	Assays, DD - 2 - 468m, DGP	2.22217	T-4635
Macdiarmid	Falconbridge Limited	2000-2001	Assays, DD - 1 - 200m, GM, HLEM, Lc	2.20837	T-4508
Macdiarmid	Falconbridge Limited	1999-2000	Assays, DD - 3 - 681m, GM, HLEM, Lc	2.20664	T-4524
Macdiarmid	Falconbridge Limited	1999-2000	Assays, DD - 5 - 1214, GM, HLEM, Lc	2.21032	T-4571
Macdiarmid, Reid	McKinnon, D.	1971	AM	Donation	T-4497
Macklem	Echo Bay Mines Ltd.	2001	Assays, DD - 3 - 599m	2.20997	T-4532
Mahaffy, Reid	Falconbridge Limited	1999-2001	Assays, DD - 2 - 399m, GM, HLEM, Lc	2.21380	T-4588
Mallard	Morin, R.J.	2000	Assays, Tr	2.21448	T-4613
Mann	East West Resource Corporation	2001	Assays, GL, Samp	2.21735	T-4620
Mann	Falconbridge Limited	2000	Assays, DD - 1 - 657m	2.20973	T-4531
Marion	Gagne, M.Y.	2001	Assays, Pr, Tr	2.22486	T-4641
Massey, Whitesides	Lalonde, D.J.	2000	Assays, DD - 2 - 269m	2.22362	T-4647
Moberly, Thorburn	Inco Limited	2001	Lc, TEM	2.21667	T-4602
Mulloy	Duess, R.L.	2000	DD - 1 - 122m, GM, Lc	OP99-277; OP99-278	T-4541
Murphy	Falconbridge Limited	2000-2001	GM, HLEM, Lc	2.21378	T-4581
Nansen	Falconbridge Limited	2000	Assays, DD - 1 - 174m	2.20834	T-4505
Nettogami River et al. (4 townships)	Eastmain Resources Inc.	1999-2000	Assays, DD - 17 - 1966m, GC,GM, HLEM, Lc, TEM	2.21429	T-4591

Township or Area	Company Name	Year	Type of Work	AFRO Number	Resident Geologist Office File
North Chabbie Lake	Eastmain Resources Inc.	1999-2001	AEM, AM, GM, HLEM, Lc	2.21435	T-4584
Ogden	Bianchi Quarries Inc.	1993-1994	Bulk, Comp, IM	NOHFC 7125	T-4624
Ogden	Echo Bay Mines Ltd.	2001	Assays, DD - 3 - 768m	2.22216	T-4638
Oke	Diatreme Explorations Inc.	1999	GM, Lc	2.21055	T-4575
Opimicon Bay	Eastmain Resources Inc.	1999-2001	AEM, AM, GM, HLEM, Lc	2.21431	T-4585
Penhorwood	La société de gestion Maskours	2000-2001	Comp	2.21339	T-4601
Pitt	M.J. Labelle Co. Ltd.	2001	GM, Lc	2.21038	T-4559
Reid	Caron, D.D.	2000	Pr	2.20662	T-4512
Robb	Falconbridge Limited	2000	GEM, IP	2.20754	T-4492
Robb	Falconbridge Limited	2001	Assays, DD - 1 - 279m	2.21050	T-4558
Robb	Huot, J.P.	1999	Assays, Pr	2.20839	T-4565
Robb	Huot, J.P.	2001	Assays, DD - 2 - 513m	2.21501	T-4586
Robb	Kerr, G.	2001	VLFEM	2.21916	T-4612
Robb	Vision Lake Mining Inc.	2000	Str	2.21398	T-4627
Scholfield	Durham, R.B.	2000	GM, IP, Lc	OP99-277; OP99-278	T-4542
Scholfield	Silverman, G.C.	1999	HM, Samp	2.21003	T-4553
Scholfield, Talbott	Diatreme Explorations Inc.	2001	GM, Lc	2.20967	T-4533
Scholfield, Talbott	Diatreme Explorations Inc.	2001	GM, HLEM, Lc	2.21506	T-4596
Shaw	Nortem Mining & Exploration	2000	Str, Tr	2.20526	T-4515
Shuel	Duess, R.L.	2000	DD - 1 - 122m, GM, Lc	OP99-277; OP99-278	T-4543
South of Ridge Lake	Baltic Resources Inc.	2001	DD - 7 - 685m	2.20996	T-4579
South of Ridge Lake	MCK Mining Corp.	2001	Assays, DD - 5 - 612m	2.21966	T-4616
Staples	Falconbridge Limited	2001	Assays, DD - 1 - 141m	2.21024	T-4529
Stetham	Beach Gold Mines Limited	1978-1980	Comp	Donation	T-4496
Stock	Bazinet, T.	1939	Assays, DD - 6 - 3370ft	Donation	T-4630
Stock	Novawest Resources Inc.	2001	Assays, DD - 2 - 583m	2.22240	T-4642
Stock	Nufort Resources Inc.	2001	GM, Lc, VLFEM	2.21049	T-4573
Thorburn	Diatreme Explorations Inc.	1999-2000	Beep, GM	2.20679	T-4518
Thorneloe	Bonhomme, J.-C.	2001	DD - 1 - 30m	2.22430	T-4645
Tooms	Kennecott Canada Exploration	1999-2000	HM, Pr, Samp	2.20931	T-4519

Township or Area	Company Name	Year	Type of Work	AFRO Number	Resident Geologist Office File
Warren	Purechem Limited	2001	Assays, Bulk	2.22146	T-4637
Whitesides	Falconbridge Limited	1997	Assays, DD - 3 - 504m	2.22401	T-4646
Whitesides	Huot, J.P.	2000	Assays, DD - 3 - 636m	2.21030	T-4551
Whitney	Anderson, S.D.	2001	IP	2.21066	T-4574
Whitney	Anderson, S.D.	2001	IP, Lc	2.21952	T-4617
Whitney	Crites, J.G.	2001	DD - 1 - 182m	2.22333	T-4640
Whitney	Royal Oak Mines Inc.	1994	Assays, DD - 22 - 20 383ft	Donation	T-4568

Table 12. Assessment files received for the Wawa area in 2001.

Abbreviations

AM.....Airborne magnetic survey
Comp.....Compilation
DD.....Diamond drilling
GC.....Geochemical survey
GEM.....Ground electromagnetic survey
GL.....Geological survey
GM.....Ground magnetic survey
GPS.....Global Positioning System
Grav.....Gravity survey
HLEM.....Horizontal loop electromagnetic survey
HM.....Heavy mineral sampling
IP.....Induced polarization survey
Lc.....Linecutting
OP.....Ontario Prospectors Assistance Program
Pet.....Petrography
Pr.....Prospecting
RES.....Resistivity survey
Samp.....Sampling (other than bulk)
Str.....Stripping
Tr.....Trenching
VLEM.....Vertical loop electromagnetic survey
VLFEM.....Very low frequency electromagnetic survey

Township or Area	Company Name	Year	Type of Work	AFRO Number	Resident Geologist Office File Designation
Abotossaway et al. (22 townships)	Algocen Mines Limited	1962-1968	Comp	Donation	WP Abotossaway - 33
Abotossaway, Corbiere, Leclaire	The Algoma Central and Hudson Bay Railway Company	1902	GL	Donation	WP Abotossaway - 32
Alarie	The Algoma Steel Corporation, Limited	1909-1947	Assays, Comp, DD - 2 - 834ft, GL, Pr, Samp, Tr	Donation	WP Alarie - 1
Allouez	Algoma Exploration & Development Company	? 1930	Comp	Donation	WP Allouez - 1
Bailloquet, Chabanel	Hutteri, H.P.	1999	Assays, GC, GPS, Pr, Samp	OP99-491; OP99-492	WP Chabanel - 44
Brackin, Leeson	Canreos Minerals (1980) Limited	1984-1985	Comp	Donation	WT Brackin - 43
Breckenridge et al. (7 townships)	Canadian Pacific Railway	1958	GL	Donation	WP Nameigos - 6
Bruyere	Peters, L.H.	1949-1951	Assays, Samp	Donation	WP Bruyere - 19
Camp Lake	McDougall, W.H.	1907-1911	GL	Donation	WP Camp Lake - 8

Township or Area	Company Name	Year	Type of Work	AFRO Number	Resident Geologist Office File Designation
Camp Lake et al. (4 townships)	The Algoma Steel Corporation, Limited	1982	Assays, Comp, Samp	Donation	WP Camp Lake - 6
Camp Lake, David Lake	The Algoma Steel Corporation, Limited	1968	Comp	Donation	WP Camp Lake - 7
Chabanel	The Algoma Steel Corporation, Limited	1980-1981	Assays, GL	Donation	WP Chabanel - 35
Chabanel	The Algoma Steel Corporation, Limited	1981	GL, GM	Donation	WP Chabanel - 36
Chabanel	The Algoma Steel Corporation, Limited	1981	Assays, GL, GM, VLFEM	Donation	WP Chabanel - 37
Chabanel	The Algoma Steel Corporation, Limited	1980	GL, GM, VLFEM	Donation	WP Chabanel - 39
Chabanel	The Algoma Steel Corporation, Limited	1980	GL	Donation	WP Chabanel - 40
Chabanel	The Algoma Steel Corporation, Limited	1980	GL	Donation	WP Chabanel - 41
Chabanel	The Algoma Steel Corporation, Limited	1980	GL	Donation	WP Chabanel - 42
Chabanel	The Algoma Steel Corporation, Limited	1981	VLFEM	Donation	WP Chabanel - 47
Chabanel et al. (8 townships)	The Algoma Steel Corporation, Limited	1955	Comp	Donation	WP Chabanel - 48
Chabanel, Esquega	The Algoma Steel Corporation, Limited	1981	Assays, DD - 3 - 289ft, GL, GM	Donation	WP Chabanel - 33
Chabanel, Esquega	The Algoma Steel Corporation, Limited	1980-1981	DD - 2 - 894ft, GEM, GM, VLFEM	Donation	WP Chabanel - 34
Chabanel, Esquega	The Algoma Steel Corporation, Limited	1949-1964	GL, GM, HLEM, VLEM	Donation	WP Chabanel - 46
Chabanel, Leclaire	Lake Superior Corporation	1910	Comp	Donation	WP Chabanel - 50
Chabanel,	Algoma Ore Properties, Limited	1948-1965	DD - 4 - 1086ft	Donation	WP Chabanel - 45
Chabanel,	Archibald, F.T.	2000	Assays, DD - 1 - 59m, HM, Pet, Pr, Samp	2.20976	WP Chabanel - 49
Chabanel,	The Algoma Steel Corporation, Limited	1981	GM, VLFEM	Donation	WP Chabanel - 38
Corbiere	Sears, S.M.	1999	Comp, Samp, Str	OP99-224; OP99-225; OP99-226	WP Corbiere - 19
Cowie	Sears, S.M.	1999	Assays, DD - 6 - 402m	OP99-224; OP99-225; OP99-226	WP Cowie - 6
David Lake	The Algoma Steel Corporation, Limited	1965-1979	Comp	Donation	WP David Lake - 46
Dunphy, Finan	Algoma Ore Properties, Limited	1914-1974	Assays, Comp	Donation	WP Dunphy - 3
Eaket	MacQuarrie, E.M.	1955	Assays, GL	Donation	WP Eaket - 1

Township or Area	Company Name	Year	Type of Work	AFRO Number	Resident Geologist Office File Designation
Esquega	Jalore Mining Company	1951	EM	Donation	WP Esquega - 31
Esquega	The Algoma Steel Corporation, Limited	1980-1982	Comp, GEM, GL, GM, VLFEM	Donation	WP Esquega - 30
Finan	Patricia Mining Corp.	2001	Assays, DD - 5 - 1027m, GL, Samp	2.22291	WP Finan - 69
Finan	Sherwood Capital Ltd.	2001	Assays, GC, Samp	2.21837	WP Finan - 68
Finan, Jacobson	Patricia Mining Corp.	2000	Assays, GL, Samp, Str, Tr	2.20883	WP Finan - 66
Finan, Jacobson	Patricia Mining Corp.	2000-2001	Assays, DD - 11 - 1987m, GL, GM, IP, Lc, RES, Tr	2.21301	WP Finan - 67
Green	Kennecott Canada Exploration	1999-2000	HM, Samp	2.21013	WP Green - 1
Hawkins	Houghton, F.A.	2000	Assays, GC, GM, Lc, VLFEM	2.21550	WT Hawkins - 31
Hawkins	McKinnon, D.	2001	DD - 2 - 214m	2.21869	WT Hawkins - 29
Jacobson	Healey, D.R.	1999	VLFEM	2.20779	WP Jacobson - 72
Jacobson	Pele Mountain Resources Inc.	1999	Assays, DD - 9 - 458m	2.20853	WP Jacobson - 73
Laforme	Kennecott Canada Exploration	2000	GM, HLEM, Lc	2.20629	WP Laforme - 2
Lastheels	Sears, S.M.	1999	GL, GM, HM, Pr, Samp	OP99-224; OP99-225; OP99-226	WP Lastheels - 12
Lastheels,	Blue Marble Mining Corp.	2000	DD - 2 - 291m, Pr, Samp	2.20650	WP Lastheels - 11
Leclaire	The Algoma Central and Hudson Bay Railway Company	1909-1954	AM, Assays, GM	Donation	WP Leclaire - 7
Leeson, Rennie	Rengold Mines Limited	1941-1979	Comp	Donation	WP Leeson - 18
Lendrum	Pele Mountain Resources Inc.	1999	Assays, HM	2.21327	WP Lendrum - 34
Lendrum	The Algoma Steel Corporation, Limited	1981	GM, VLFEM	Donation	WP Lendrum - 28
Lendrum	The Algoma Steel Corporation, Limited	1981	GEM, Grav	Donation	WP Lendrum - 29
Lendrum	The Algoma Steel Corporation, Limited	1980-1981	GEM, GM, VLFEM	Donation	WP Lendrum - 30
Lendrum	The Algoma Steel Corporation, Limited	1980	GL	Donation	WP Lendrum - 31
Lendrum	The Algoma Steel Corporation, Limited	1981	GM, HLEM	Donation	WP Lendrum - 32
Lendrum	The Algoma Steel Corporation, Limited	1979	GL, GM	Donation	WP Lendrum - 33
Lendrum	The First Nation of Michipicoten Cultural Association	2001	Str	2.21475	WP Lendrum - 35
McMurray	1138992 Ontario Limited	2000	Assays, Pr, Samp	2.20642	WP McMurray - 78
McMurray	Peters, L.H.	1926-1931	Assays, Samp	Donation	WP McMurray - 77

Township or Area	Company Name	Year	Type of Work	AFRO Number	Resident Geologist Office File Designation
McMurray	The Algoma Commercial Company, Limited	1901	Comp	Donation	WP McMurray - 79
McMurray	The Algoma Steel Corporation, Limited	1981	Assays, DD - 2 - 186ft	Donation	WP McMurray - 80
Musquash	Tremblay, M.A.	1999-2000	HM, Pr, Samp	OP99-245	WP Musquash - 1
Nebonaionquet	Palmgren, O.	1904-1945	Comp	Donation	WP Nebonaionquet - 3
Point Isacor	River Gold Mines Ltd.	2000	Assays, DD - 4 - 672m	2.21048	WP Point Isacor - 20
Rabazo	Konig, U.	1998-2000	Assays, Samp, Str, Tr	2.20580	WP Rabazo - 38
Rennie	Falconbridge Limited	2000	Assays, DD - 2 - 433m	2.21802	WP Rennie - 15
Riggs	Patricia Mining Corp.	2000	Assays, DD - 5 - 445m, GC, GL, Lc, Samp, Tr	2.21348	WP Riggs - 60
Riggs	The Algoma Steel Corporation, Limited	1901-1981	Assays, Comp, DD - 38 - 5685ft, GL, Tr	Donation	WP Riggs - 59
Stone, Tiernan	Consolidated Lake Superior Company	1902	GL	Donation	WP Stone -1
West	Nicholson, T.S.	2000	Assays, DD - 2 - 69ft, Pr, Samp, Str, Tr	2.20932	WP West - 10

Table 13. Publications received by the Timmins Regional Resident Geologist Office in 2001.

Title	Author	Type and Year of Publication
SINCLAIR LAKE AREA - Quaternary Geology	Alcock, P.W. & Miller, M.J.	MAP 2653
Regional modern alluvium sampling survey of the Temagami - Marten River area, Northeastern Ontario	Allen, S.E.	OGS Open File Report 6043
Report of Activities, 2000, Resident Geologist Program: Timmins and Sault Ste. Marie Districts	Atkinson, B.T., Hailstone, M., Seim, G.Wm., et al.	OGS Open File Report 6050
Results of regional till sampling for kimberlite and base metal indicator minerals, Peterlong Lake - Radisson Lake area, Northeastern Ontario	Bajc, A.F. & Crabtree, D.C.	OGS Open File Report 6060
Till compositional database, kimberlite and base metal indicator minerals, Peterlong Lake - Radisson Lake area, Northeastern Ontario	Bajc, A.F. & Crabtree, D.C.	Dataset MRD 78
Summary of field work and other activities, 2001	Baker, C.L., Kelly, R.I. & Parker, J.R.	OGS Open File Report 6070
A Symposium on the tectonic history and mineral deposits of the Western Cordillera	CIM	CIM Special Volume No. 8, 1966
Superior PGE 2001: Field Conference, September 2001, Thunder Bay, Ontario	CIM Geological Society	Technical Session Abstracts
Geochronology Data for Ontario	Easton, R.M.	Dataset MRD 75
KAPUSKASING - CHAPLEAU Aeromagnetic Survey: Total magnetic field	FedNor, Industry Canada, Natural Resources Canada & MNDM	OGS MAPS 81 672 to 81 699

Title	Author	Type and Year of Publication
KAPUSKASING - CHAPLEAU Aeromagnetic Survey: First Vertical Derivative with Keating Correlation Coefficient Anomalies	FedNor, Industry Canada, Natural Resources Canada & MNDM	OGS MAPS 81 700 to 727
Regional lake sediment and water geochemical data, Northwestern Ontario (NTS 41K, 41N)	Friske, P.W.B., Hornbrook, E.H.W., Lynch, J.J., et al.	GSC Open File Report 2361, 1991
CANADA - PRINCIPAL MINERAL AREAS	Geological Survey of Canada	GSC MAP 900A, 2000
Physical evaluation and assessment of bedrock aggregate resource potential, North Shore of Lake Superior -- Operation Treasure Hunt	Jagger Hims, Clayton Research & Agritrans Limited	OGS Open File Report 6072
Report of Activities, 2000, Resident Geologist Program: Red Lake and Kenora Districts	Lichtblau, A., Raoul, A., Ravnaas, C. et al.	OGS Open File Report 6047
Structural Geology of the Holloway Mine, Abitibi greenstone belt	Luinstra, B. & Benn, K.	OGS Open File Report 6045
Report of Activities, 2000, Resident Geologist Program: Thunder Bay North District	Mason, J.K. White, G.D., O'Brien, M.S., et al.	OGS Open File Report 6048
Reconnaissance-scale till survey in the New Liskeard - Temagami region, Ontario: kimberlite indicator minerals and geochemistry	McClenaghan, M.B., Kjarsgaard, I.M. & Kjarsgaard, B.A.	GSC Open File Report 4086
ICE FLOW INDICATORS FOR THE NEW LISKEARD - TEMAGAMI AREA	McClenaghan, M.B. & Veillette, J.J.	GSC MAP OF 3385
Report of Activities, 2000, Resident Geologist Program: Kirkland Lake and Sudbury Districts	Meyer, G., Cosec, M., Grabowski, G.P.B., et al.	OGS Open File Report 6051
FRANZ-MANITOWIK LK-KINNIWABI LK AREA, Quaternary Geology	Morris, T.F.	MAP 2573
HAWK JUNCTION - MICHIPICOTEN RIVER AREA, Quaternary Geology	Morris, T.F.	MAP 2574
Quaternary geology of the Wawa area, Northeastern Ontario	Morris, T.F.	OGS Open File Report 6055 & MRD 73
Nonferrous Metals Outlook, Dec. 2000	Natural Resources Canada	Report, 2000
TIMMINS AREA - BOUGUER GRAVITY	Ontario Geological Survey, Placer Dome (CLA) Limited, Explorers Alliance Corporation, NRCAN	MAP 81 670
TIMMINS AREA - VERTICAL GRAVITY GRADIENT	Ontario Geological Survey, Placer Dome (CLA) Limited, Explorers Alliance Corporation, NRCAN	MAP 81 671
Regional ground gravity survey from the Timmins Collaborative Gravity Survey Project	Ontario Geological Survey, Placer Dome (CLA) Limited, Explorers Alliance Corporation, NRCAN	Dataset MRD 79
Results of modern alluvium sampling, Kapuskasing - Fraserdale area, Northeastern Ontario: Operation Treasure Hunt -Kapuskasing Structural Zone	Ontario Geological Survey	OGS Open File Report 6044 & MRD 68
Peterlong Lake - Radisson Lake area high density lake sediment survey: gold and PGE data - Operation Treasure Hunt	Ontario Geological Survey	OGS Open File Report 6053 & MRD 70
Montreal River Headwaters Area lake sediment survey, Northern Ontario: Gold and PGE data-- Operation Treasure Hunt	Ontario Geological Survey	OGS Open File Report 6061 & MRD 80
Results of modern alluvium sampling, Chapleau area, Northeastern Ontario: Operation Treasure Hunt - Kapuskasing Structural Zone	Ontario Geological Survey	Open File Report 6063 & MRD 82

Title	Author	Type and Year of Publication
Results of modern alluvium sampling, Foleyet Area, Northeastern Ontario: Operation Treasure Hunt - Kapuskasing Structural Zone	Ontario Geological Survey	OGS Open File Report 6065
Results of modern alluvium sampling, Coral Rapids Area, Northeastern Ontario: Operation Treasure Hunt - Kapuskasing Structural Zone	Ontario Geological Survey	OGS Open File Report 6068
Ontario airborne geophysical surveys, magnetic and electromagnetic data, Amyot - Browning area: Grid and Profile data	Ontario Geological Survey	Dataset 1200 (REV)
Ontario airborne geophysical surveys, magnetic and electromagnetic data, Gowan - Evelyn area: Grid and Profile data	Ontario Geological Survey	Dataset 1202
Ontario airborne geophysical surveys, magnetic and electromagnetic data, Geco - Manitouwadge area: Grid and Profile data	Ontario Geological Survey	Dataset 1205ab
Ontario airborne geophysical surveys, magnetic and electromagnetic data, Albany River - James Bay area: Grid and Profile data	Ontario Geological Survey	Dataset 1209
COCHRANE AREA AMEM Survey: Residual Mag field & EM anomalies	Ontario Geological Survey - Operation Treasure Hunt	MAPS 82 007 to 82 009
COCHRANE AREA AMEM Survey: 2nd Vertical Derivative & Keating coefficients	Ontario Geological Survey - Operation Treasure Hunt	MAPS 82 010 to 82 012
COCHRANE AREA AMEM Survey: EM Decay constant & anomalies	Ontario Geological Survey - Operation Treasure Hunt	MAPS 82 013 to 82 015
COCHRANE AREA AMEM Survey: Apparent conductance & EM anomalies	Ontario Geological Survey - Operation Treasure Hunt	MAPS 82 214 to 82 216
KIRKLAND LAKE AREA AMEM: Residual Mag & EM anomalies	Ontario Geological Survey - Operation Treasure Hunt	MAPS 82 047 to 82 052
KIRKLAND LAKE AREA AMEM: 2nd Vertc'l Deriv. & Keating coefficients	Ontario Geological Survey - Operation Treasure Hunt	MAPS 82 053 to 82 058
KIRKLAND LAKE AREA AMEM: EM decay constant & anomalies	Ontario Geological Survey - Operation Treasure Hunt	MAPS 82 059 to 82 064
KIRKLAND LAKE AREA AMEM: Apparent conductance & EM anomalies	Ontario Geological Survey - Operation Treasure Hunt	MAPS 82 218 to 82 223
MATHESON AREA AMEM Survey: Residual Mag field & EM anomalies	Ontario Geological Survey - Operation Treasure Hunt	MAP 82 025
MATHESON AREA AMEM Survey: 2nd Vertical Derivative & Keating coefficients	Ontario Geological Survey - Operation Treasure Hunt	MAP 82 026
MATHESON AREA AMEM Survey: EM decay constant & anomalies	Ontario Geological Survey - Operation Treasure Hunt	MAP 82 027
MATHESON AREA AMEM Survey: Apparent conductivity & EM anomalies	Ontario Geological Survey - Operation Treasure Hunt	MAP 82 217
Quaternary geology of the Timmins Area, Northeastern Ontario	Paulen, R.C.	M.Sc. Thesis
Hydrothermal iron oxide copper-gold and related deposits: A global perspective, Volume 1	Porter, T.M., ed.	
ALBANY RIVER - JAMES BAY AREA AMEM Survey: Total magnetic field	Purchased Data	MAPS 60 045 to 60 065
ALBANY RIVER - JAMES BAY AREA AMEM Survey: 1st Vertical Derivative & Keating coefficients	Purchased Data	MAPS 60 066 to 60 086

Title	Author	Type and Year of Publication
CORAL RAPIDS AREA AMEM Survey: Total magnetic field	Purchased Data	MAP 60 174
CORAL RAPIDS AREA AMEM Survey: 2nd Vertical Derivative & Keating coefficients	Purchased Data	MAP 60 175
GECO - MANITOUWADGE AREA AMEM Survey: Residual magnetic field & EM anomalies	Purchased Data	MAPS 60 012 to 60 018
GECO - MANITOUWADGE AREA AMEM Survey: 2nd Vertical Derivative & Keating coefficients	Purchased Data	MAPS 60 019 to 60 025
GECO - MANITOUWADGE AREA AMEM Survey: Apparent Resistivity & EM anomalies	Purchased Data	MAPS 60 026 to 60 032
GOWAN - EVELYN AREA AMEM Survey: Total magnetic field & EM anomalies	Purchased Data	MAP 60 009
GOWAN - EVELYN AREA AMEM Survey: 1st Vertical Derivative	Purchased Data	MAP 60 010
GOWAN - EVELYN AREA AMEM Survey: 1st Vertical Derivative & Keating Coefficients	Purchased Data	MAP 60 010 Rev
GOWAN - EVELYN AREA AMEM Survey: Apparent Resistivity & EM anomalies	Purchased Data	MAP 60 011
KAPISKAU RIVER EAST AREA AMEM Survey: Residual magnetic field	Purchased Data	MAPS 60 176, 60 177
KAPISKAU RIVER EAST AREA AMEM Survey: 2nd Vertical Derivative & Keating coefficients	Purchased Data	MAPS 60 178, 60 179
KESAGAMI LAKE AREA AMEM Survey: Residual magnetic field	Purchased Data	MAP 60 180
KESAGAMI LAKE AREA AMEM Survey: 2nd Vertical Derivative & Keating coefficients	Purchased Data	MAP 60 181
NATOGAMI LAKE AREA AMEM Survey: Total magnetic field & EM anomalies	Purchased Data	MAP 60 185
NATOGAMI LAKE AREA AMEM Survey: 2nd Vertical Derivative & Keating coefficients	Purchased Data	MAP 60 186
NATOGAMI LAKE AREA AMEM Survey: Apparent resistivity & EM anomalies	Purchased Data	MAP 60 187
Report on mineral exploration activities in Quebec, 2000	Quebec MRN	Report DV 2001-02, 2000
SCINTREX HEM-802 anomalies over thin sheet conductors (to accomp. AEM maps for the Wawa area)	Ramani, N.	1981
KAMISKOTIA LAKE AREA- Quaternary Geology	Richard, J.A.	MAP 2656
PAMOUR AREA - Quaternary Geology	Richard, J.A.	MAP 2655
Shining Tree Area high density regional lake sediment and water geochemical survey, Northeastern Ontario	Russell, D.F. & Hamilton, S.M.	OGS Open File Report 6062
Lake sediment and water data for the Shining Tree Area	Russell, D.F. & Hamilton, S.M.	Dataset MRD 81
A compilation of references for kimberlite, diamond and related topics	Sage, R.P. & Gareau, T.	OGS Open File Report 6067

Title	Author	Type and Year of Publication
Report of Activities, 2000, Resident Geologist Program: SE, SW and MMIC	Sangster, P.J., McGuinty, W.J., Papertzian, V.C., et al.	OGS Open File Report 6052
SCHREIBER SHEET, Precambrian Geology Compilation Series	Santaguida, F.	MAP 2665
Report of Activities, 2000, Resident Geologist Program: Thunder Bay South District	Schnieders, B.R., Scott, J.F., Smyk, M.C., et al.	OGS Open File Report 6049
Preliminary data results of drift exploration for platinum group elements, Northwestern Ontario	Searcy, C.A.	OGS Open File Report 6054
Northeastern Ontario Mineral Symposium, "New Minerals for the New Millenium", Sudbury, April 2001	Sudbury Prospectors & Developers Association, Ontario Prospectors Association & Ontario Geological Survey	Symposium Abstracts
Geochemistry of the Formation of Diamond	Szetu, S.S.	Ph.D. Thesis, 1954
DANA LAKE AREA- Quaternary Geology	Tucker, C.M. & Richard, J.A.	MAP 2660
TIMMINS AREA - Quaternary Geology	Tucker, C.M. & Sharpe, D.	MAP 2662
Bats and Mines	Tuttle, M.D. & Taylor, D.A.R.	1998
Precambrian Geology of the Watabeag Lake area	Vaillancourt, C.	OGS Open File Report 6042
TIMMINS WEST - BRISTOL & OGDEN TOWNSHIPS, Precambrian Geology	Vaillancourt, C., Pickett, C.L. & Dinel, E.	MAP P.3436
PDAC 2001 Short course	Various authors	Prospectors & Developers Association of Canada course notes
An introduction to Ontario fossils	Waddington, J.	Publication of the Royal Ontario Museum, 1979

All publications were issued during 2001 unless otherwise noted.
All maps listed were published by the Ontario Geological Survey unless otherwise noted.
AMEM: Airborne magnetic and electromagnetic

Ontario

Ontario Geological Survey
Regional Resident Geologist Program

Timmins Regional Resident Geologist
(Sault Ste. Marie District)--2001

by

M. Hailstone and D. Farrow

2002

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TIMMINS REGIONAL RESIDENT GEOLOGIST SAULT STE. MARIE DISTRICT--2001

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INTRODUCTION

Primary mineral production from the Sault Ste. Marie District during 2001 consisted of bedrock aggregate from 4 established quarries. A total of 16 individuals and companies conducted mineral exploration and prospecting programs in the district during the year. Diamonds and copper–precious metals mineralization were the major focus of exploration in 2001. Other exploration targets included platinum group metals (PGM), gold, and base metals. Details on exploration activity can be found in the text and a summary is available in Table 1. Location of exploration programs are shown on Figure 1. Assessment files received are listed in Table 2.

Production of sand and gravel aggregate for the year in the Sault Ste. Marie District includes 804 319.82 tonnes from 73 Licenses and 347 489.38 tonnes from 108 Permits, totalling 1 151 809.2 tonnes (Ontario Aggregate Resource Corporation, 2002).

Sand and gravel aggregate figures do not include production from bedrock aggregate quarries discussed in the Quarrying Activity section of this report.

QUARRYING ACTIVITY

Production continued from 4 of 5 established bedrock quarries in the Sault St. Marie District. The quarries are keyed with letters (in parentheses) to Figure 3.

Ontario Trap Rock (A Division of R.W. Tomlinson Limited)

Ontario Trap Rock (A) continued quarrying crushed bedrock aggregate from Nipissing diabase at their site, 3 km east of the town of Bruce Mines in Plummer Additional Township. R.W. Tomlinson Limited produces approximately 800 000 tonnes of high-quality aggregate from this facility yearly for the construction industry.

The operating season begins in March and normally ends in November, employing 25 people on a seasonal basis. About 90% of the aggregate is transported by ship from Ontario Trap Rock's deep-water port on Lake Huron; the remaining product is shipped via rail and truck. Lower than normal lake water levels during the 2001 shipping season resulted in higher costs due to smaller shipments. The quarry has an estimated $2 million impact on the area economy. (G. Gautier, Ontario Trap Rock, personal communication, 2002).

Gilbertson Enterprises Quarry

Gilbertson Enterprises (B) of St. Joseph Island operates a quarry east of Highway 548 and south of Highway 17 in Tarbutt Additional Township. The quarried rock is a reddish-pink to grey granophyre, a late differentiate typical of Bruce Mines-type Nipissing diabase. Several sizes of aggregate and landscaping products are obtained from crushing and screening operations. Production decreased in 2001 to approximately 20 000 tonnes in response to reduced construction locally. Deliveries in 2001 were drawn principally from stockpiles and some additional quarrying. (S. Eddy, Gilbertson Enterprises, personal communication, 2002).

Table 1. Exploration activity in the Sault Ste. Marie District in 2001 (keyed to Figure 1).

Abbreviations

AEM ..... Airborne electromagnetic survey
AM ..... Airborne magnetic survey
Bulk ..... Bulk sampling
DD ..... Diamond drilling
DDH ..... Diamond drill hole(s)
GC ..... Geochemical survey
GEM ..... Ground electromagnetic survey
GL ..... Geological Survey
GM ..... Ground magnetic survey
GRA ..... Ground radiometric survey
Grav ..... Gravity survey
HLEM ..... Horizontal loop electromagnetic survey
HM ..... Heavy mineral sampling
IM ..... Industrial mineral testing and marketing
IP ..... Induced polarization surveyey
KIM ..... Kimberlite indicator mineral sampling
Lc ..... Linecutting
Met ..... Metallurgical testing
OD ..... Overburden drilling
ODH ..... Overburden drill hole(s)
PEM ..... Pulse electromagnetic survey
PGM ..... Platinum group metals
Pr ..... Prospecting
RES ..... Resistivity survey
Samp ..... Sampling (other than bulk)
Seismic ..... Seismic survey
SP ..... Self-potential survey
Str ..... Stripping
Tr ..... Trenching
UG ..... Underground exploration/development
VLEM ..... Vertical loop electromagnetic survey
VLFEM ..... Very low frequency electromagnetic survey

No	Company/Individual (Occurrence Name) or Property	Township/Area (Commodity)	Exploration Activity
1.	Brunette, B. & Morin, R.	Otter (PGE)	Pr, Samp, Str
2.	Canabrava Diamond Corporation / Paramount Ventures and Finance Inc. & Kennecott Canada Exploration Inc.	Several townships (Diamond) [see text]	P, Samp, KIM, AEM, AM, Str, Tr
3.	Eastmain Resources Inc./Phelps Dodge Corporation of Canada Limited	Plummer Additional (Cu, Au)	Pr, Samp
4.	Frankow, P.	Neill, Moggy (Au, Zn, Cu)	Pr, Samp
5.	Gibbs, W.	Kincaid, Ryan, Slater (Cu, Au, Ag)	Pr, Samp, Str
6.	Intrepid Minerals Corporation	Tupper, Archibald, Shields, Kincaid, Aweres, Deroche, Ryan (Cu,Au)	Pr, Samp, Grav
7.	Gold Insight Resources Ltd.	Jarvis, Galbraith (Cu, Au, Ag and PGE)	Pr, Samp
8.	Londry, J. & Maclahlan B.	Gaudette (PGE)	Pr, Samp
9.	Lucuik, G.	Deroche, Veil (Cu, Au)	Pr, Samp
10.	Lucuik, G. & Hicks, C.	Vankoughnet (Ag, Pb, Au)	Pr, Str, Tr, Samp
11.	Tremblay, M. & Robert, J.	Moen (Au, BM)	Pr, Samp, Str
12.	Pacific North West Capital Corp.	Joubin (PGE)	Pr, Samp
13.	Pipoli, D.	Slater, Ryan, Kincaid (Cu, Au, Ag)	Pr, Samp, Str
14.	North Atlantic Nickel Corp	Ley , Kars (Cu Au)	DD, Samp
15.	SouthernEra Resources Limited	Numerous townships, Rocky Island Ranger Lake area (Diamond)	KIM, Samp, Pr
16.	Western Keltic Mines Inc.	Anderson, Chesley, Hodgins (Cu, Au)	Pr, Samp, Str, GM

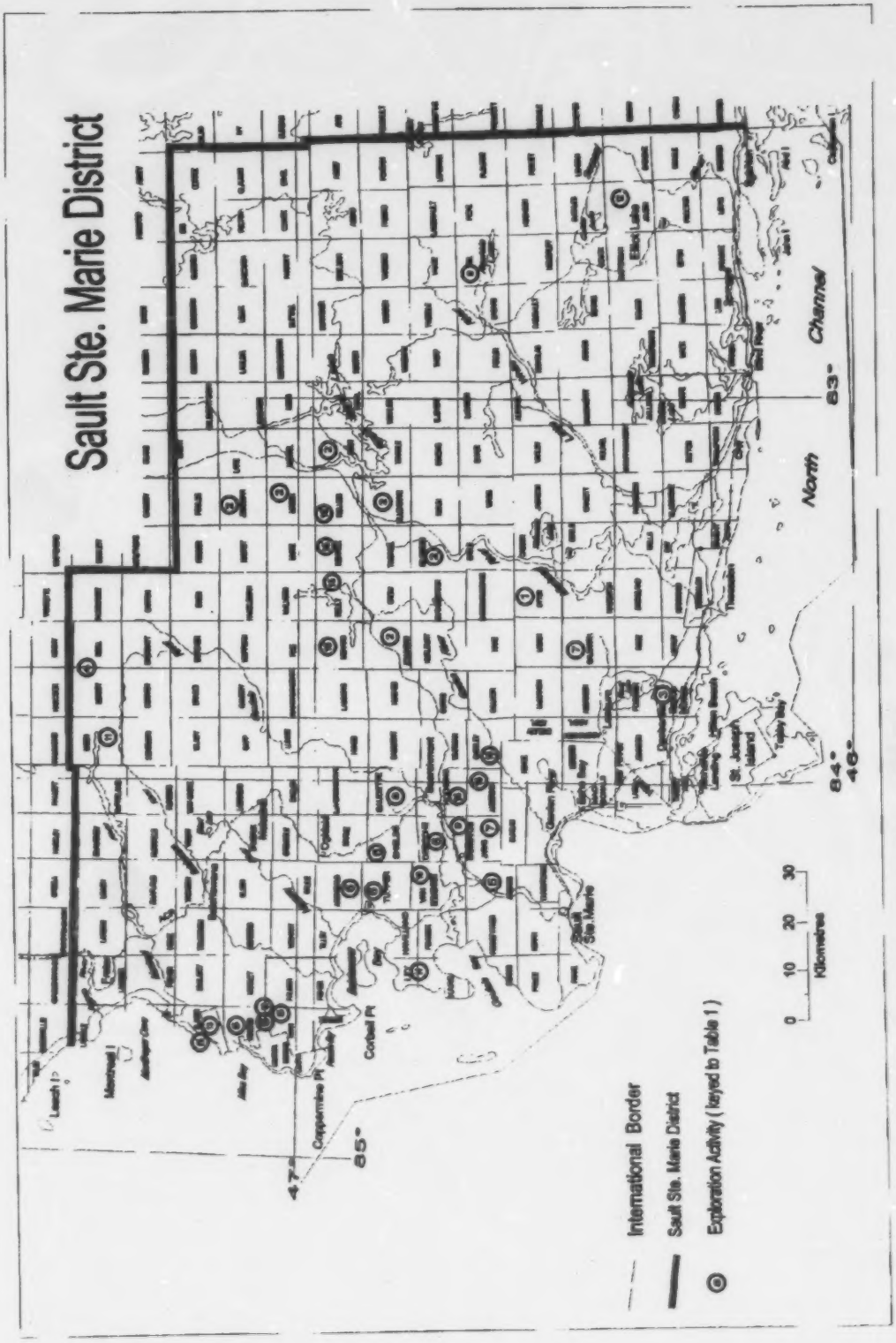


Figure 1. Exploration Activity in Sault Ste. Marie District in 2001

Table 2. Assessment files received in the Sault Ste. Marie District office in 2001.

Abbreviations

AEM ..... Airborne electromagnetic survey
AM ..... Airborne magnetic survey
ARA ..... Airborne radiometric survey
Beep ..... Beep Mat survey
Bulk ..... Bulk sampling
DD ..... Diamond drilling
DDH ..... Diamond drill hole(s)
DGP ..... Down-hole geophysics
GC ..... Geochemical survey
GEM ..... Ground electromagnetic survey
GL ..... Geological Survey
GM ..... Ground magnetic survey
GRA ..... Ground radiometric survey
Grav ..... Gravity survey
HLEM ..... Horizontal loop electromagnetic survey
HM ..... Heavy mineral sampling
IM ..... Industrial mineral testing and marketing
IP ..... Induced polarization survey
Lc ..... Linecutting
Met ..... Metallurgical testing
OD ..... Overburden drilling
ODH ..... Overburden drill hole(s)
OMIP ..... Ontario Mineral Incentive Program
OPAP ..... Ontario Prospectors Assistance Program
PEM ..... Pulse electromagnetic survey
PGM ..... Platinum group metals
Pr ..... Prospecting
RES ..... Resistivity survey
Samp ..... Sampling (other than bulk)
Seismic ..... Seismic survey
SP ..... Self-potential survey
Str ..... Stripping
Tr ..... Trenching
UG ..... Underground exploration/development
VLEM ..... Vertical loop electromagnetic survey
VLFEM ..... Very low frequency electromagnetic survey

Township or Area	Company Name	Year	Type of Work	AFRO Number	Resident Geologist Office File Designation
Palmer	Konig, U.	2000	Str, Tr	2.20587	SSMP Palmer-33
Joubin	Hawke, D.	2000	Pr	2.20884	SSMP Joubin-10
McDonell	Lucuik, G.	2000	Pr	2.20859	SSMP McDonell-07
Moen, Moggy	Tremblay, M.	1999	Samp	OPAP 99-245	SSMP Moen-04
Otter	Barry, R.	1999	VLFEM, GM	OPAP	SSMP Otter-013
Deagle	Ward, M.	2001	Samp	2.20761	SSMP Deagle-01
Galbraith	Archibald, J.	2001	Samp, DD	2.21884	SSMP Galbraith-05
Neill	Frankow, P.	1999	VLFEM	2.21956	SSMP Neill-20
Kincaid	O'Connor, T.	2001	Str	2.21479	SSMP Kincaid-15
Aweres	Falconbridge Ltd.	2000	Grav, Elev	2.21803	SSMP Aweres-04
Vankoughnet	Lucuik, G.	2001	Pr	2.22144	SSMP Vankoughnet-12
Palmer	Bjornaa-Gimby	1952	Tr	Donated	SSMP Palmer-34
MacDonald	Roledge, S.	1952, 1960	Pr	Donated	SSMP MacDonald-01
MacDonald	Osborne, B.	1908	Pr	Donated	SSMP MacDonald-02
Wishart	Algoma Ore Div.	1963	Pr	Donated	SSMP Wishart-09
Gaudette	Algoma Ore Div.	1979	Samp	Donated	SSMP Gaudette-02

Nestorville Quarry

The Nestorville Quarry (C) is located 4 km west of Thessalon near the town of Nestorville in Lefroy Township and is operated by Smelter Bay Aggregates. Crushed Nipissing diabase is produced for a number of uses, chiefly rail ballast and quality construction aggregate used in fabricating high-strength concrete. Crushing is accomplished using contracted portable machinery with a yearly production capacity of approximately 1 million tonnes. Production was suspended in 2001 due to poor demand and low product prices. (R. Gardner, Smelter Bay Aggregates, personal communication, 2002).

Root River Sandstone Quarry

Root River Sandstone Quarry (D) operated by E. Kosiba is located within the city limits of Sault Ste Marie in Tarentorus Township. The quarry produces an attractive red flagstone from Jacobsville sandstone, which is used mostly for stone facing, flag walkways, retaining walls and landscaping. Production increased slightly again this year with a total of 105 tonnes extracted during 2001. (E. Kosiba, personal communication, 2002).

Rancourt Quarry

The Rancourt Quarry (E) is located approximately 41 km north of the town of Thessalon in Gould Township. Quarrying operations commenced in 1999, producing black argillite for use in the construction of fireplaces, walkways, outdoor stairs and patios. Due to a shortage of skilled labour in 2001, quarrying was limited to approximately 20 tonnes. Market studies in southern Ontario and elsewhere, however, indicate good product demand for 2002. (R. Bertolo, personal communication, 2002).

EXPLORATION ACTIVITY

Exploration activities in 2001 are summarized in Table 1. This year, approximately 3900 mining claim units were staked in the Sault Ste. Marie District Geologist's area. Staking volumes such as this have not been seen since the Hemlo gold rush, in northwestern Ontario, during the period between 1982 and 1990. Two-thirds of this new staking is for diamond exploration and the other third is dominated by exploration for Olympic Dam-type iron oxide–copper–gold (IOCG) mineralization (Figure 2).

Canabrava Diamond Corporation, Kennecott Canada Exploration Inc. and Paramount Ventures and Finance Inc. Ontario Joint Venture Project

In July 2001, Canabrava Diamond Corporation announced the 3 joint venture partners had agreed to amend the original joint venture agreement entered into in 1999. The principal points of the amendment are (a) The revised Area of Interest will include the Rocky Island Lake Project and the Pivot Lake Claims; and (b) Canabrava will assume the role of Project Operator with immediate effect. Under the terms of the amendment, each party will be free to engage in exploration outside the revised Area of Interest without obligation to the other party. However, any land within the original Area of Interest acquired by Kennecott or Canabrava before June 30, 2003, will be subject to a 1.5% Gross Overriding Royalty payable to the other party. The southern half of the new Ontario joint venture project lies within the Sault Ste. Marie District Geologist Office boundary.

A total budget of $850 000 was to be spent in the revised project area before year's end. In addition, Kennecott has committed to provide a minimum of $500 000 in 2002 to test at least 10 targets by drilling or trenching (subject to such targets being developed for testing). Canabrava Diamond Corporation and joint venture partners Kennecott Canada Exploration Inc. and Paramount Ventures and Finance Inc. completed an extensive staking program for diamonds during the early summer. Claims have been staked in 9 separate blocks totalling 1454 claim units within 12 townships bounded by Jollineau, Foulds and Wardle townships. Option agreements have been finalized with a number of individual claim holders. By July, Canabrava's exploration teams were in the field conducting the first

phase of a planned four-phase summer to fall exploration program consisting of prospecting, mapping, till sampling, airborne geophysics and possibly diamond drilling. (Canabrava Diamond Corporation, press release, July 25, 2001)

In early April, the partners announced that 2 diamond-bearing boulders had been discovered within a well-defined kimberlite indicator mineral plume on the Rocky Island Lake Project. The boulders were discovered several kilometres apart within the same indicator mineral plume. Six diamonds were recovered from a 107-kilogram sample of one boulder (Sample A), including 2 macrodiamonds and 4 microdiamonds, with five of six stones being described as transparent white fragments. Three of the diamonds display remnant octahedral form and the remaining 3 are irregular fragments. One diamond was recovered from a 142-kilogram sample collected from the second boulder (Sample B). The diamond recovered from Sample B is somewhat unusual in that it is deep green in colour. (Canabrava Diamond Corporation, press release, April 17, 2001)

As a first priority, prospecting teams focussed on locating the source of the 2 diamond-bearing kimberlite boulders discovered by Kennecott crews in early 2001. Canabrava field geologists discovered additional kimberlitic boulders within the vicinity of the original discovery and rapidly defined a boulder train extending for 8 km. The train lead to an outcrop of kimberlitic rock that appeared similar to the diamond-bearing kimberlite boulders. A 120 kilogram sample was excavated from the outcrop and representative material was submitted for petrological evaluation and microdiamond analysis. (Canabrava Diamond Corporation, press release, August 21, 2001)

In October, Canabrava announced that field mapping of the outcrop discovered at the head of one boulder train revealed it to be dike-like in nature. No microdiamonds were recovered from a 132-kilogram sample taken from this outcrop and the primary source of the diamond-bearing kimberlite boulders remains to be located. In the same press release, it was reported that an airborne geophysical survey of 5366 line-kilometres and ground follow-up investigation of a number of promising anomalies was successfully completed in September. The location of the initial airborne survey block was based on the mapped locations of boulder trains and kimberlitic indicator mineral plumes. An additional airborne geophysical survey of 10 646 line-kilometres was completed during the fourth quarter of 2001. Diamond drilling is scheduled in January and February of 2002, when ice conditions are suitable for testing underwater targets. (Canabrava Diamond Corporation, press release, October 22, 2001)

In November, Canabrava Diamond Corporation announced the successful completion of the summer to fall field program. Major objectives of the program were achieved with the discovery of additional diamond-bearing kimberlitic boulder trains, ground follow-up on numerous geophysical anomalies identified from the airborne geophysical survey and the acquisition of 118 strategically located till samples. All samples were submitted to Kennecott's Thunder Bay laboratory for initial processing, after which the mineral concentrates will be picked for kimberlite indicator minerals and analyzed by microprobe at a commercial laboratory in South Africa. Kennecott planned to have all samples processed by year-end with final processing to be completed by the end of January 2002. (Canabrava Diamond Corporation, press release, November 2001)

SouthernEra Resources Limited

During the summer and fall, SouthernEra Resources Limited staked 986 claim units in 13 townships in the vicinity of Menard, Reilly, Rollins, Renwick and Maeck townships. The company reports performing KIM sampling and prospecting on their claims during the year. (P. Jones, SouthernEra Resources Limited, personal communication, 2001).

Michael L. Page

Michael Page holds 1200 claim units staked early in the year for Billiton Resources Canada Inc. The ground has been optioned to 2 companies: Intrepid Minerals Corporation and Western Keltic Mines Inc. Both companies are looking for an "Olympic Dam type" iron oxide–copper–gold (IOCG) deposit.

The claims were staked in 2 blocks. The first block, in Tupper, Shields and Archibald townships, has been optioned to Intrepid Minerals Corporation. The second block, in Anderson, Hodgins and Chesley townships has been optioned to Western Keltic Mines Inc. (*see* Figure 2).

Figure 2. Staking (to Feb.16,2002) in the Sault Ste. Marie District. Staking in central portion for diamonds, in western portion of map for IOCG mineralization and in southeast at East Bull Lake for PGE.

10 0 10 20 30 40 50 kilometres
Township Boundaries
Staking to Feb. 16, 2002
Areas withdrawn from staking to Feb.16, 2002
Patented or leased land with surface and/or mining rights

Compiled by
Ministry of Northern Development and Mines
Resident Geologist's Program
Sault Ste. Marie District Geologist staff
February 20, 2002

Land tenure data sets for the entire province of Ontario are available in digital format as ArcView® shape files; contact Ministry of Northern Development and Mines Publication Sales at 1(888)415-9845 or visit: Ministry of Northern Development and Mines website for live updated claimaps at:
http://www.mndm.gov.on.ca/MNDM/MINES/LANDS/mismnpge.htm

North Atlantic Nickel Corp.

North Atlantic Nickel Corp. reported in September that diamond drilling had begun at the Baraga Project, Ontario. The Baraga Project is an Olympic Dam-type (IOCG) target in the Keweenawan Rift near Batchewana Bay, approximately 50 km north of Sault Ste. Marie. North Atlantic Nickel Corp. entered into 2 agreements to acquire 100% interest in 44 km^2 of mineral rights from a private company and an individual. The surface rights are included with 39 km^2 of the property. Five square kilometres of mineral rights are subject to a 2.5% Net Smelter Return, which can be reduced at any time to a 1% Net Smelter Return by paying $1 million.

Dr. J. North, President and CEO of North Atlantic Nickel, comments:

> "The property covers most of a 6 km by 4 km magnetic anomaly (the "Baraga Anomaly") concealed by flat-lying, post tectonic, Keweenawan sandstone. In exposed rocks east of the anomaly and east of the sandstone cover sequence, sodic alteration assemblages with lead-zinc-silver occurrences greater than 10 km from the anomaly change to potassic hydrothermal alteration assemblages with copper-gold-iron oxide stockworks and breccias adjacent to the anomaly. The nature and zonation of mineral occurrences and secondary hydrothermal alteration patterns indicates that the concealed Baraga Anomaly may be a copper-gold-iron oxide breccia similar to Olympic Dam, South Australia." (North Atlantic Nickel Corp., press release, September, 2001)

A past history of mining in the Batchewana Bay area includes the polymetallic Coppercorp and Tribag Mines.

In October, North Atlantic Nickel Corp. reported 2 diamond drill holes (545 m) were completed at the Baraga project, which had not been previously tested by diamond drilling. Rocks of the Keweenawan Rift were intersected. Twenty samples of drill core have been submitted for routine assaying, but it is not expected that the rocks will contain anything of commercial interest.

The drill target was a regional airborne gradient magnetic low anomaly, similar to other Kweenawan felsic breccia pipes, such as the past-producing TriBag Mine and the Jorgan porphyry copper–molybdenum prospect. This target was considerably larger. Rocks intersected in diamond drilling included siltstone of the Jacobsville Formation unconformably overlying reversely polarized cycle 1 basaltic flows of the lower Mamainse Point Formation (J. North, North Atlantic Nickel Corp., personal communication, 2001).

Intrepid Minerals Corporation and BHP Resources Canada Inc.

Intrepid Minerals Corporation announced in May that the company had entered into an agreement to option the Batchawana Bay property from Billiton Resources Canada Inc. Under the terms of the agreement Intrepid Minerals Corp. committed to an exploration expenditure of $250 000 in the first 9 months and a total of $500 000 within 18 months. This option requires Intrepid to spend a total of $1 250 000 over 4 years to earn a 50% interest in the property covering the Batchawana Bay magnetic and gravity anomalies.

The property comprises 820 claim units covering 13 400 hectares. The package covers geophysical anomalies considered by Billiton and Intrepid to be diagnostic of an iron oxide–copper–gold (IOCG) deposit environment. Current fieldwork identified coincident hydrothermal alteration and copper–iron-bearing breccias, which are characteristic of IOCG systems.

Intrepid also staked 95 claim units over a regional magnetic high in Kincaid and Ryan townships. This target was identified in "Recommendations for Exploration" in Report of Activities 2000 (Hailstone 2001). Two additional blocks have been staked for Intrepid in Deroche Township and VanKoughnet Township.

Intrepid is one of the few companies actively engaged in the search for feasible deposits of these complex copper–gold–iron oxide–(uranium, rare earth) ore bodies. The program at Batchawana is designed to test one of the areas with significant potential for hosting the hematite end of the spectrum of IOCG deposits. In addition, Intrepid is independently targeting magnetite- and hematite-associated prospects along the Midcontinent Rift margin, which are recognized as having IOCG affinities.

In December, Intrepid Minerals Corporation and Falconbridge Limited formed a strategic alliance to explore for IOCG deposits within the circum-Superior region. As part of this agreement, Intrepid, as operator, will be required to incur expenditures totaling $950 000 over 3 years commencing January 1, 2002. Under the terms of the agreement, Falconbridge will have a right to enter into an option agreement with Intrepid on any target property identified as a result of the exploration work within the circum-Superior region. (Intrepid Minerals Corporation, press releases, 2001)

Western Keltic Mines Inc.

In 2001,Western Keltic Mines Inc. signed a Letter of Intent with Billiton Resources Canada Inc. to acquire a 70% interest in the Sault Dam Property, located 25 km northeast of Sault Ste. Marie. The 29 claim, 371 claim unit property is located in Anderson, Chesley and Hodgins townships. Western Keltic Mines Inc. can earn a 70% interest by spending $1.75 million on exploration and issuing 250 000 shares to Billiton over a four-year period. Billiton will have a First Back-In right to earn an additional 20% interest in the property by spending the next $3.5 million over a maximum of 3 years. Total expenditures reported on the Sault Dam Property in 2001 was $71 394.

The Sault Dam Property is underlain by Archean metavolcanic rocks and granite gneiss in faulted contact with Paleoproterozoic sediments of the Lorrain and Gowganda formations (Bennett et al. 1975; Giblin 1973). The property covers a 5 km long, northwest-trending magnetic anomaly extending westward from a prominent vertical gradient gravity anomaly measuring 5 by 6 km. The Chesley Cooper prospect, where grades locally range from 5 to 25% copper, up to 50 g/t gold and up to 24 g/t silver lies within the property boundary (Sault Ste. Marie District Geologist's Office, assessment files). Mapping also shows hematization associated with quartz veining in the northeast corner of Anderson Township (Giblin 1973).

This year, Western Keltic Mines Inc. completed a reconnaissance sampling, prospecting, a geological mapping program and ground geophysics on the property. (SEDAR Company Documents for Western Keltic Mines Inc.)

Eastmain Resources Inc. / Phelps Dodge Corporation of Canada, Limited

In December 2000, Phelps Dodge Corporation of Canada staked 192 claim units in Plummer Additional Township for copper–precious metal mineralization. The property covers the McGregor Road breccia that has been traced over a strike length of 6.5 km. The heterolithic breccia consists of disoriented, angular to rounded blocks of mostly Lorrain Formation quartz arenite crowded in a dark, milled, fine-grained matrix, together with areas of evidently non-brecciated Lorrain Formation quartz arenite (Frarey 1977). The project encompasses 8 iron oxide – copper ± uranium occurrences in Plummer Additional Township, located 5 km north of the historic copper mining town of Bruce Mines, 60 km east of Sault Ste. Marie.

Eastmain Resources Inc. announced it acquired an option to earn 100% interest in the Plummer Additional property from Phelps Dodge Corporation of Canada Limited by incurring $300 000 in work expenditures over a three-year period. Phelps Dodge will retain a 2% Net Smelter Return royalty subject to a buyout of one-half of the royalty. (Eastmain Resources Inc., press release, Jan. 2002)

Golden Temple Mining Corp. / Falconbridge Limited - Island Lake Copper Property

In November 2001, Golden Temple Mining Corp. optioned the Island Lake copper property in Aweres Township from Falconbridge Limited. Under the proposed terms of the agreement, Golden Temple Mining Corp. has the option to earn a 55% undivided interest in the property near Sault Ste. Marie, Ontario. (Golden Temple Mining Corp., press release, November, 2001) (Note: Golden Temple Mining Corp. announced a name change to Amerigo Resources Ltd., effective March 8, 2002.)

The property is underlain by Archean gneiss. Mineralization is associated with Keweenawan hematite-matrix breccias with albitized breccia clasts containing chalcopyrite. During 1965 to 1966, Kennco Explorations (Canada) Ltd. completed stripping, trenching, sampling, geological mapping and induced polarization, resistivity and electromagnetic surveys, followed by diamond drilling in 18 holes (totalling 2400 feet). In 1970, Colleen Copper (Copperville Mining) optioned the property, performed trenching and drilled 10 holes, totalling 3550 feet. During 1980, Highland-Crow Resources Ltd. optioned the property, but filed no assessment work, however, information donated to the Sault Ste. Marie District Geologist's Office contains geological mapping, trenching and diamond drill compilation data dated 1983. In 2000, Falconbridge performed a Gravity survey over the property.

Gold Insight Resources Ltd.

In December, Gold Insight Resources Ltd. held 86 claim units in Jarvis Township for copper and precious metals potential. These claims surround the Jardun Mine, a past producer of zinc, lead and silver. The company also holds 63 claims in Galbraith Township for copper and precious metals, and 25 claims in Maeck Township for diamond exploration.

LAND USE PLANNING ACTIVITY

Staff of the Sault Ste. Marie District Geologist's Office provided input to the Ontario Living Legacy review process for sites to be regulated in 2001 in Sault Ste. Marie and Sudbury. The Office provided comments on the Great Lakes Heritage Coastline to the Regional Land Use Co-ordinator in February.

The District Geologist provided comments on 6 consents to Ministry of Municipal Affairs and Housing (MMAH) personnel with additional comments on the Official Plan for the Corporation of the Township of the North Shore. The office also provided input to the MNDM Mines and Minerals Division Regional Land Use Co-ordinator on the MMAH Planning Act – Provincial Policy Statements. Copies of maps and reports for Official Plans of municipalities within the District are kept on file at the Sault Ste. Marie District Geologist Office.

In August, office staff responded to a request by EcoTec Environmental Consultants Inc. on the potential impact on the environment of an upgrading of a section of Highway 129.

SAULT STE. MARIE DISTRICT STAFF AND ACTIVITIES

The office received 891 visitors and responded to 2139 telephone calls during the year. The Drill Core storage facility was visited by 3 clients.

District Geologist M. Hailstone and District Support Geologist D. Farrow staff the Sault Ste. Marie office. Technical assistance was provided by Summer Experience students D. Ratelle and B. Kraft, between May and August. The office provided co-operative education student placement opportunities to 2 students from Sir James Dunn Collegiate and Vocational School: D. Ratelle, from February to May, and G. Raper, between October and January. These students assisted with assessment work filing and updating the MDI database. D. Farrow performed a two-week assignment as acting District Geologist in the Sudbury office during August.

M. Hailstone participated in an MNR Living Legacy Signature site network meeting in Sault Ste. Marie in June along with Regional Land Use Geologists A. Drost and D. Rowell. D. Farrow attended an MNR presentation on the Great Lakes Heritage Coast initiative in April in Sault Ste. Marie.

The District Support Geologist attended training sessions in WHMIS, basic GIS, CPR/First Aid and received certification as the worker representative to the Joint Health and Safety Committee through health and safety training in Sudbury and Sault Ste. Marie.

Staff of the District Geologist Office completed 21 field visits during the year (Table 3). Staff provided 2 field trips to the area for prospectors and industry focussing on Keweenawan-age rocks of the Mamainse Point Formation.

D. Farrow attended the Prospectors and Developers Association of Canada convention in Toronto in March, assisting with the Northwestern and Northeastern Ontario regional displays. In April, M. Hailstone attended the Northwestern and Northeastern Ontario Regional Mines and Minerals Symposia in Thunder Bay and Sudbury. In September, M. Hailstone attended the Resident Geologist's annual meeting in Sudbury. Office staff participated in Provincially Significant Mineral Potential training in Sudbury October 2001 and January 2002.

During September and October 2000, approximately 350 abandoned mine sites (AMIS) were documented by Sonic Soil Sampling Inc., subcontracting to Aqua Terre Solutions Inc. The data collected from these sites are available from the Abandoned Mines Co-ordinator, Ministry of Northern Development and Mines, Sudbury.

PROPERTY EXAMINATIONS

Table 3. Property visits conducted by the Sault Ste. Marie District office 2001.

Number (keyed to Figure 3)	Property/Occurrence: Location
1	B. Brunett / R. Morin claims: Otter Twp.
2	B. Gibbs copper occurrence: Ryan Twp.
3	Cheny Mine: Casson Twp.
4	Clay exposures in gravel pits: Korah and Tarentorus twps.
5	Collection of basalt samples for Mining Matters: Kincaid Twp.
6	Flagstone quarry, Gowganda Fm. Argillite member: Gould Twp.
7	G. Lucuik property vein hematite zone: Deroche Twp.
8	Jacobsville sandstone outcrops on Whitefish Island: Awenge Twp.
9	Jacobsville sandstone outcrops unmapped: Pennefather Twp.
10	Keweenawan felsic subvolcanic intrusions: Ryan Twp.
11	Felsic subvolcanic intrusions N. Pancake Bay: Ryan and Kincaid twps.
12	Keweenawan outcrops N. Goulais Bay: Key, Lars and Fenwick twps.
13	Lwr. Huronian Thessalon volcanics, Livingston Cr Fm.: Aweres Twp.
14	Nipissing diabase in gravel pit: Aweres Twp.
15	PGE sampling Nipissing diabase Hwy 108: Gunterman Twp.
16	Point Aux Mines copper occurrence: Slater Twp.
17	Shoreline outcrops and felsite island: Ryan and Kincaid twps.
18	Syenite exposures: Tiernan Twp. (Wawa, not shown on map)
19	T. Nicholson Keweenawan subvolcanic felsic intrusions: Ryan Twp.
20	Tribag Mine: Nicolet Twp.
21	Unmapped Huronian (Gowganda Fm.) outcrop: Tilley Twp.

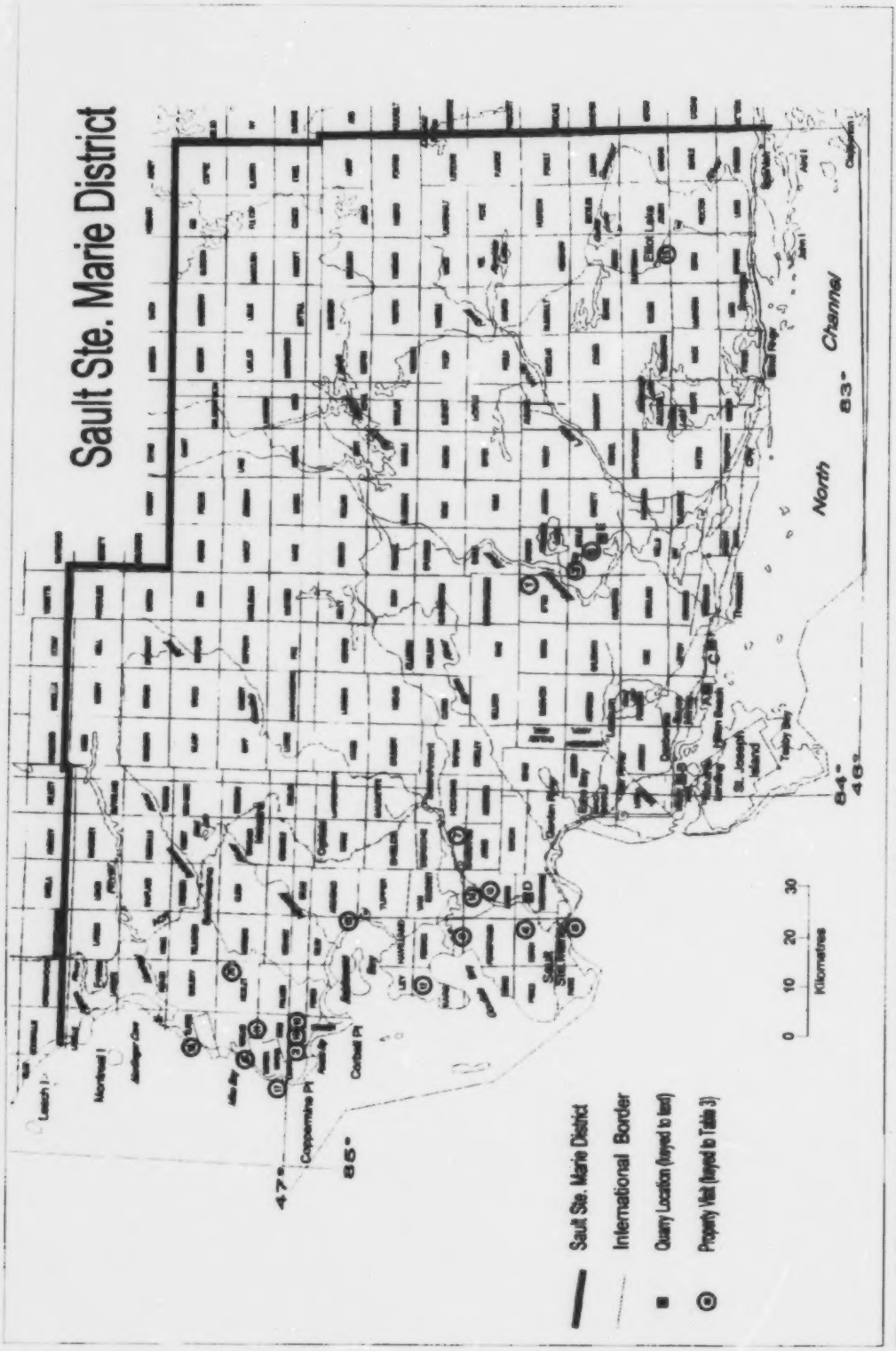


Figure 3. Property visits and field examinations Sault Ste. Marie District in 2001.

RECOMMENDATIONS FOR EXPLORATION

Iron Oxide–Copper–Gold (IOCG) Deposits in the Sault Ste. Marie District

GEOLOGY

The south part of the Sault Ste. Marie District is underlain along the north shore of Lake Huron by Paleoproterozoic, rift-related sedimentary rocks of the Huronian Supergroup. Along the east shore of Lake Superior and north to Wawa, rift-related volcanic and sedimentary rocks of the Keweenawan-age Midcontinent Rift are exposed. These rocks were deposited on, and intrude Archean granite gneiss and the western margins of the Batchawana and Gamitagama greenstone belts.

Huronian Supergroup sediments are thought to have been deposited during rifting during the Paleoproterozoic, which occurred between 2.45 Ga (age obtained from Copper Cliff rhyolite in the Sudbury area) and 2.22 Ga (age obtained from Nipissing diabase, which intrudes Huronian Supergroup sediments). Along the shoreline of Lake Huron, rocks south of the Murray Fault exhibit amphibolite-facies metamorphism. McKim Formation pelitic sediments south of the Murray Fault contain staurolite. Late Penokean orogenic igneous events, such as the Cutler granite (age of 1.74 Ga: Davidson, Van Breeman and Sullivan, 1992), may have been the source of this metamorphism.

Albite alteration events occurring in Huronian Supergroup rocks along the north shore of Lake Huron, and in particular the Sudbury area, have been dated to 1.7 Ga (Schandl, Gorton and Davis 1994). Schandl, Gorton and Davis note elevated REE minerals associated with albitized Huronian Supergroup sediments and suggest that carbonatitic or alkaline intrusions at depth may have generated sodium-rich fluids. Fedo et al. (1997) related these sodium-rich fluids to expulsion of basinal brines within the Huronian Supergroup during the Penokian orogeny. It is possible that either or both mechanisms of sodium metasomatism may have contributed to IOCG-style mineralization in the Sault Ste. Marie District. Six iron oxide–copper–gold (IOCG) deposits in the Curnamona Province of South Australia and New South Wales have been dated at 1.7 Ga (Williams and Skirrow 2000). Three deposits, including Ernst Henry in the Cloncurry mining district and the eastern portion of the Mount Isa Block in northwest Queensland, have similar ages (Haynes 2000).

Paleoproterozoic rocks in the Sault Ste. Marie District are cut by 2 prominent northwest-trending structures. The Moon Lake structure trends northwest from Spragge Township on the shore of Lake Huron, to Jackson Township, 5 km east of Wakomata Lake, on the north side of the Paleoproterozoic succession. The second structure is the Echo Lake homocline, which trends northwest from Thessalon to Echo Lake on the east side of the Garden River First Nation. This structure is known to host 6 gold occurrences, including the past-producing Havilah gold mine. The Echo Lake homocline also controls emplacement of Nipissing diabase.

Keweenawan-age rocks, exposed along the east shoreline of Lake Superior, consist of basaltic, subaerial flows intercalated with conglomerate and volcanic agglomerate, which have subsequently been intruded by subvolcanic felsic stocks and dikes. These rocks are unconformably overlain by late Keweenawan-age Jacobsville sandstone beds that exhibit characteristics of equatorial weathering. The Keweenawan-age volcanic-sedimentary succession and the weathered Jacobsville sandstone unconformably overlie Archean granitic and metavolcanic-sedimentary rocks. Rocks along the east coast of Lake Superior are offset by arcuate, northeast-trending, Midcontinent Rift-related transform faults (Manson and Halls 1994). These faults mimic an earlier, Archean structural pattern associated with the Kapuskasing Structural Zone.

MINERALIZATION

Iron oxide is plentiful in some Upper Huronian Supergroup sedimentary rocks, in particular rocks of the Lorrain Formation. Conglomerate units within the Lorrain Formation contain chert and hematite banded iron formation clasts. An upper Lorrain Formation arkose member is pervasively hematized. Red, hematite and magnetite heavy

mineral foreset beds are common in arenite of the upper Lorrain Formation. Immediately north of Gordon Lake in the northeast corner of Johnson Township, an occurrence of hematized stromatolite-like features was observed in a sericitized quartz arenite of the upper Lorrain Formation (M. Hailstone, personal observation, 2001). In the Whitefish Falls area, a breccia unit has been interpreted as evidence of Nipissing diabase intrusion into unconsolidated Lorrain Formation and Gowganda Formation sediments (Shaw, Young and Fedo 1999).

Over 120 copper, polymetallic and/or precious metal occurrences are documented within sedimentary rocks of the Huronian Supergroup in the Sault Ste. Marie District. Most occurrences are structurally controlled, sulphide-bearing quartz-carbonate veins and breccias. Albitization or sodium metasomatism and associated hematization accompany many of these vein and breccia-type deposits. Documented production from Huronian Supergroup rocks (excluding the Sudbury Basin and Cobalt Embayment) is 183 787 631 pounds copper, 91 027 ounces gold and 146 321 ounces silver, representing a value of $219.7 million (1994 dollars) (Willoughby 1994). By far the greatest production came from the Pater Mine in Spragge Township.

Mineralization associated with volcanic rocks of the Keweenawan-age Mamainse Point Formation is characterized by the presence of copper minerals associated with hematization, brecciation and sodium metasomatism. The best example of sodium metasomatism can be found in an extensive hematitized breccia at the Island Copper Project in Aweres Township. Other examples include the Tribag Mine, which produced from a predominantly chalcopyrite-rich ore hosted within a breccia pipe overprinted by quartz stockworks; the Coppercorp Mine, where mineralization occurs in north-northwest-trending, structurally controlled calcite-quartz-chalcocite veins and breccias; and at the Mamainse Copper Mine on the shore of Lake Superior, where north-northwest-trending structures, dipping 80 to 85° east, host calcite-quartz veins mineralized with chalcocite and native copper. At the Mamainse Copper Mine, Keweenawan-age basaltic flows are intruded by felsite dikes up to 10 cm in width, which host native copper and chalcocite in cooling fractures, forming a crackle breccia pattern within the felsite dikes (M. Hailstone, personal observations, 2001).

Figure 4. North-trending, 45° east-dipping fault exposed in outcrop along Hwy. 556, located in northeast Aweres Township.

A study of ores from the Tribag Mine, the Jorgan Porphyry and the Coppercorp Mine attributes copper mineralization to the mixing of meteoric waters (0-100°C) with magmatic brines (350-450°C). Richards (1985) proposes that the source of the saline brines is Late Keweenawan felsic magmatism (Cutler granite). His conclusions extend the zone of metallogenic interest well into the Archean basement rocks and implies either a crustal source for the metals by partial melting or a mantle source, or by partitioning from basic rift-related magmas. Primary copper, nickel and platinum mineralization in the Duluth and Coldwell intrusive complexes favour the latter option as the primary source of metals.

Within the Paleoproterozoic Huronian Supergroup rocks and Late Keweenawan volcanic-sedimentary rocks in the Sault Ste. Marie District, copper–precious metal occurrences are associated with hematization and sodium metasomatism. Age determinations of alteration in Huronian Supergroup metasedimentary rocks appears coeval with deposits of the IOCG class in Australia. Copper mineralization associated with felsic magmatism and breccias and temperatures of ore-forming fluids are also consistent with IOCG-class deposits. Described below are some suggestions for further exploration for these targets in the Sault Ste. Marie District.

Exploration Opportunities in Jarvis and Aweres Townships for Iron Oxide–Copper–Gold Deposits and Diamonds

The prospective area is located in Aweres, Jarvis, Duncan and Deroche townships, approximately 20 km northeast of Sault Ste. Marie, Ontario. The geology of the area is described by Frarey (1977), Bennett et al. (1975), Bennett, Sawitzky and Whittaker (1976), and Bennett and Sawiuk (1979) (Figure 5).

There are several features in this area that indicate potential for IOCG deposits, most notably the intersection of regional structural features. A regional northeast-trending, arcuate structure, the Anderson fault, intersects and offsets the northwest-trending Echo Lake homocline (Figure 6). A favourable geologic setting exists along the margin of the Archean craton, which is unconformably overlain by Paleoproterozoic rocks of the Huronian Supergroup intruded by minor Keweenawan-age felsic dikes and associated mineralized structures. A significant characteristic of the area is the abundance of hematite mineralization associated with the Bellevue fault. Along with numerous occurrences of hematite and specular hematite vein systems associated with the Bellevue fault, the area also contains several lead-zinc-copper vein occurrences associated with north-trending faults.

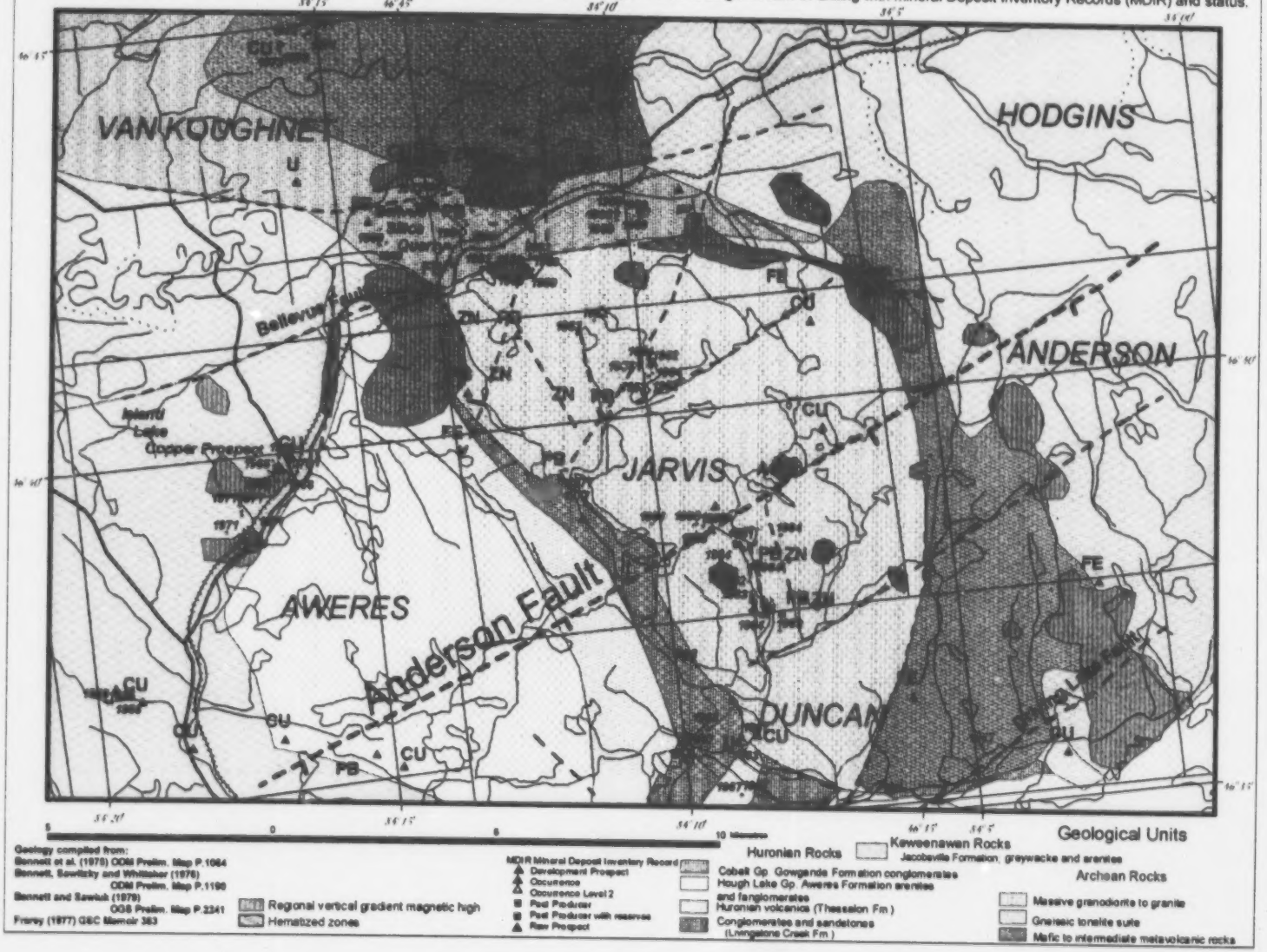
Past production in the area includes the Northland Lake hematite zones, mined between 1880 and 1900, and the Jardun lead-zinc-copper deposits mined periodically between 1875 and 1957.

In the northeast corner of Aweres Township, a fault strikes north along Hwy 556 and dips approximately 45° east. The fault hosts hematite veins in Archean granite, Paleoproterozoic conglomerates and argillites of the Gowganda Formation, and quartz arenite of the Lorrain Formation. In some locations along the cliff face immediately east of the highway, the senior author has observed hematite after magnetite. A north-trending regional magnetic high is located 1 km east of the fault exposed in the roadcut (Figures 4 and 5). Outcrop, east of the road, show patches of limonite weathering, suggesting the presence of sulphides in the fault.

Uranium and sulphides are reported from the west-central portion of Duncan Township, hosted by Matinenda Formation quartz pebble conglomerate, at the base of the Huronian Supergroup succession. There is no record of this conglomerate-hosted, uranium-sulphide mineralization having been evaluated for gold. Outcrops of Huronian Supergroup basal conglomerate have been documented by Bennett, Sawitzky and Whittaker (1976) in the Maude and Ann lakes area. A pyrite occurrence located in Jarvis Township, 400 m north of Reserve Lake, is hosted by Livingston Creek conglomerate and is documented by Bennett et al. (1975). This occurrence should also be sampled for gold content. Each of these occurrences may also show paleoplacer gold possibilities for the area.

Bennett et al. (1975) mapped lamprophyre dikes associated with a south-trending, arcuate structure cutting across the northwest corner of Jarvis Township. These lamprophyre dikes should be investigated for their potential to host diamonds (Bennett et al. 1975).

Figure 5. Geology of the Aweres, Jarvis, Deroche and Duncan townships area, showing diamond drilling and date of drilling with Mineral Deposit Inventory Records (MDIR) and status.



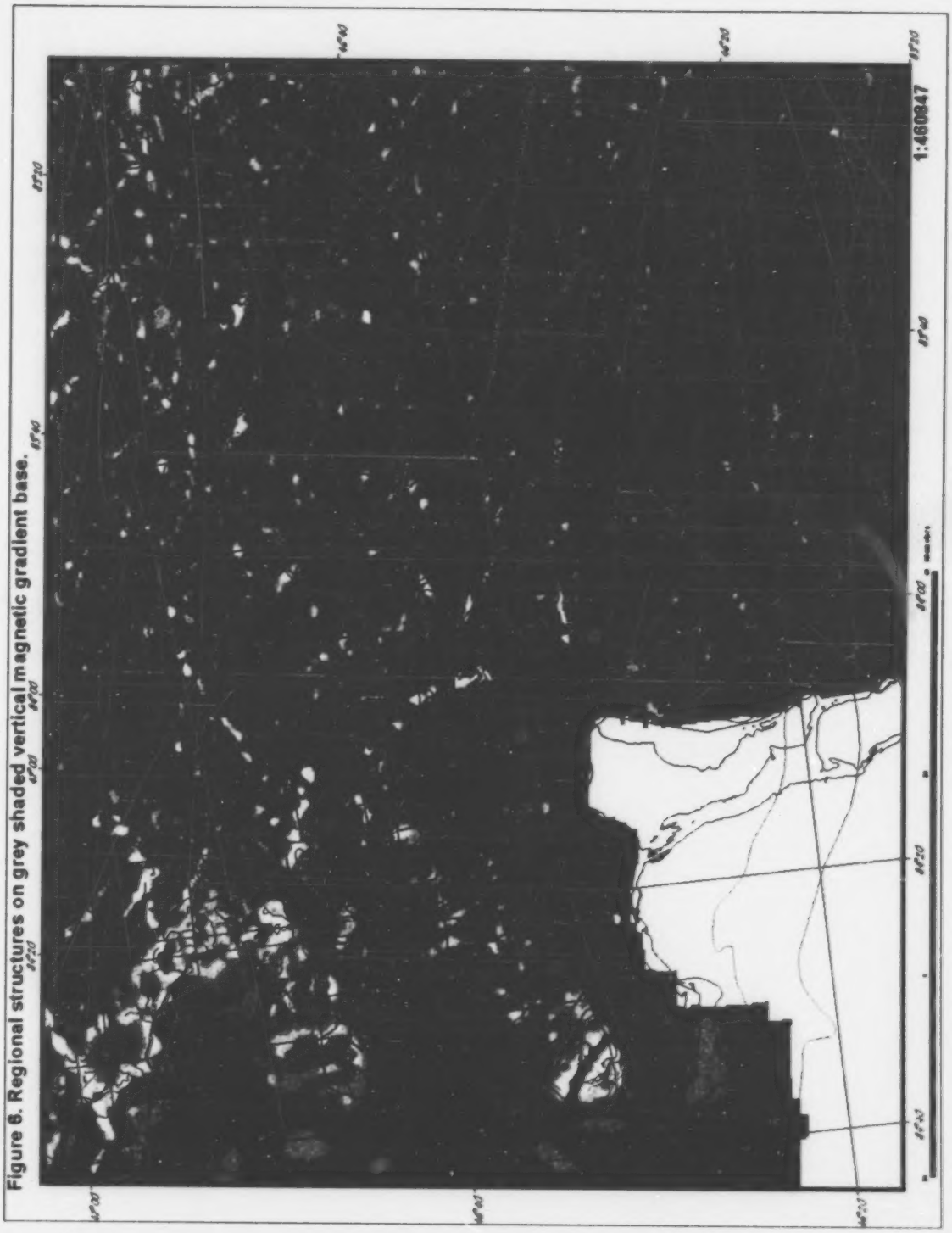


Figure 8. Regional structures on grey shaded vertical magnetic gradient base.

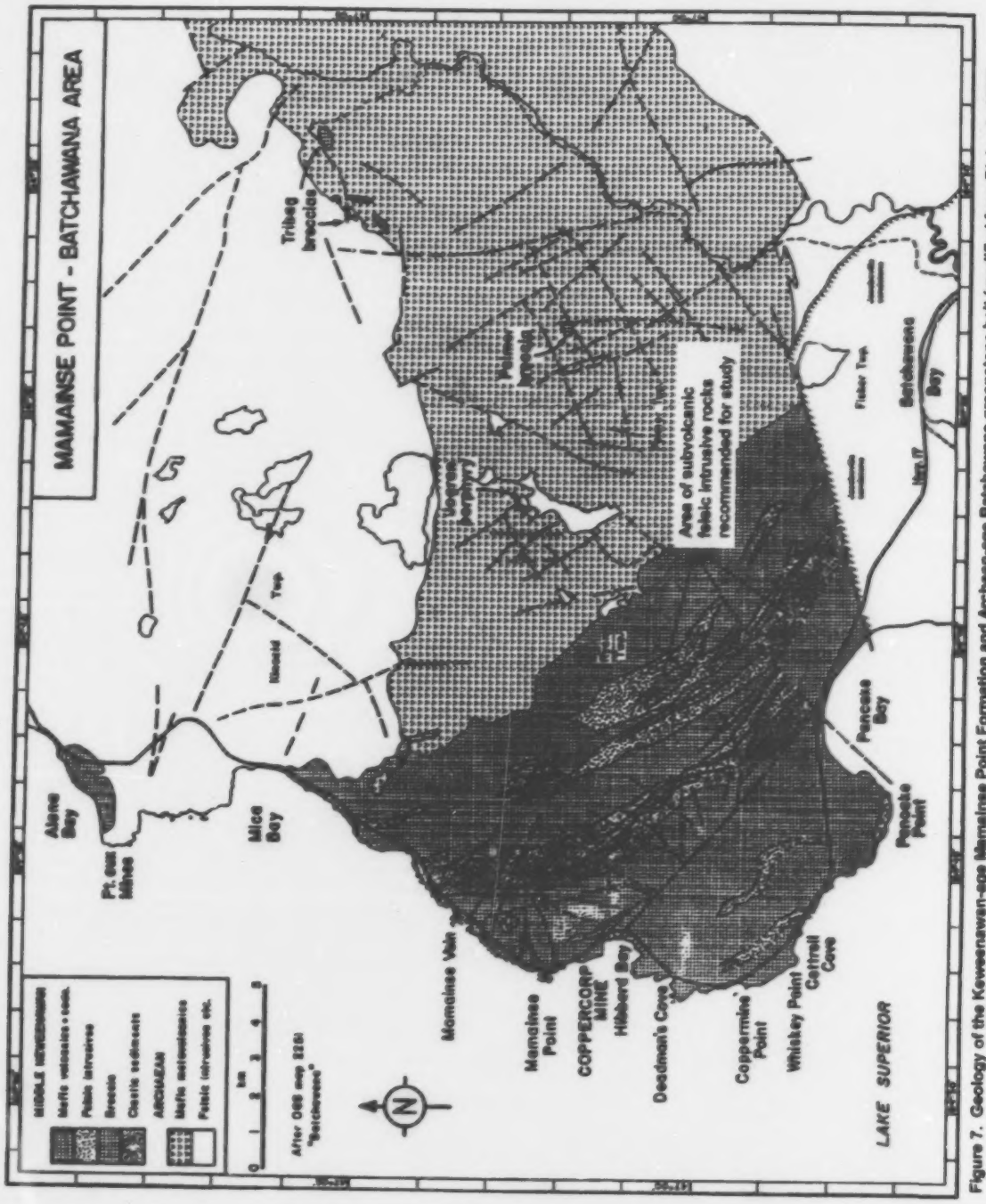


Figure 7. Geology of the Keweenawan-age Mamainse Point Formation and Archean-age Batchawana greenstone belt (modified from Richards 1985).

Copper–Precious Metal Mineralization in the Mamainse Point Formation and its Relationship to Felsic Magmatism

The Mamainse Point Formation is located in Kincaid and Ryan townships, 50 km north of Sault Ste. Marie and is accessible by Hwy 17. Keweenawan-age felsic intrusive rocks of the Mamainse Point Formation have been interpreted as being coeval with basaltic flows of cycle 1 and cycle 2 rift-related tholeiitic flood basalts (Figure 7). The felsic intrusive rocks of the Mamainse Point Formation have been postulated to be a third cycle of Keweenawan-age igneous activity that postdates and intrudes the early mafic flows.

Annells (1973) and Massey (1980) conducted studies on the lithologies of the Mamainse Point Formation. Richards (1985) studied hydrothermal alteration of the rocks and mineralized zones. Fluid inclusion and stable isotope work indicates that fluid mixing was a major cause of ore deposition. Two end-member fluids were identified: a high temperature, high salinity (350-450°C, 15-20 eq wt % $CaCl_2$) boiling brine, and a cooler hybrid fluid (<100-350°C, 0-15 eq wt % $CaCl_2$) of meteoric origin.

Jackson (1977) completed a geochemical study of the felsic rocks intruding cycle 2 Mamainse Point Formation basalt flows and concluded the overall field and chemical evidence suggested a single magmatic source for the felsites. Jackson classified the felsites as potassic keratophyres.

Field evidence suggests that all the felsic rocks were intruded as a third, late-stage igneous event into the cycle 1 and 2 basaltic flows. This felsic intrusive event is possibly coeval with the early stage of structural deformation responsible for down faulting of the earlier basaltic cycles toward the Midcontinent Rift axis under Lake Superior. A study, similar to Jackson's (1977), of the felsic rocks intruding cycle 1 basaltic flows could provide insight to the composition and time of emplacement for the eastern felsic intrusive rocks, which would provide a better understanding of copper–precious metal deposition in one of Canada's historic copper mining environments.

OGS ACTIVITIES AND RESEARCH BY OTHERS

Watts Griffis and McOuat carried out a kimberlite indicator (KIM) mineral stream sediment survey between Sault Ste Marie and Espanola. The Ontario Treasure Hunt year 3 project commenced in August and sample collection was completed by the end of September. This program complements the Chapleau–Kapuskasing KIM survey results released in July 2001 (Ontario Geological Survey 2001).

Other research in the Sault Ste. Marie District include the studies listed below.

Micromorphological analyses, by J. Menzies (2000a, 2000b), of microstructures in diamictites of the lower Gowganda Formation north of Elliot Lake indicate both brittle and ductile deformation likely developed during glacial sedimentation. The diamictites were possibly deposited in a proximal subglacial or subaqueous environment as a product of soft deforming-bed sediments being extruded beneath an active ice sheet at its grounding-line margin as it entered a marine basin. This is the first known example of glacial deforming-bed conditions to have possibly developed beneath Precambrian ice sheets.

Comparison of major and trace element geochemistry has revealed differences and similarities that may provide insight into the erosional history of part of the Archean Superior Province of the Canadian Shield during the last 2 Ga and some aspects of the evolution of the Earth's atmosphere (Young 2001a).

Huronian deposition is interpreted, by Young (2001b), as the result of a partial Wilson cycle, involving rifting and development of a southward-facing passive margin. Geochemical investigations have contributed to paleoclimatic and provenance studies and have helped to define basin-wide metasomatic events. Sedimentary rocks of the Whitewater Group are considered to be a portion of a widespread flysch apron that spread across the southern margin of the Superior Province as a foreland basin fill, in response to the closure phase of the Wilson cycle during the Penokean orogeny.

Neodymium model ages for fine-grained formations of the Huronian Supergroup (McKim, Pecors, Gowganda, Gordon Lake) range from 3 to 2.55 Ga and indicate a provenance dominated by the Late Archean Superior Province to the north and west (McLennan, Simonetti and Goldstein 2000). Isotope geochemistry suggests that the provenance changed during deposition of the Gordon Lake Formation.

Results of a structural analysis, by Riller et al. (1999), of Archean basement, Huronian cover and various igneous rocks and regional tectonometamorphic correlations suggest that structures in the eastern Penokean orogen formed dominantly by dextral transpression. Tectonic activity led to distributed, heterogeneous deformation of Archean basement rocks and exhumation of deep crustal rocks in the Sudbury area and the Kapuskasing Structural Zone, but may have failed to accrete Paleoproterozoic terranes in the Lake Huron area. The Great Lakes tectonic zone and the Murray fault, master dislocations in the Penokean orogen, may have acted as crustal weakness zones that influenced the orientation and development of 1.1 Ga Midcontinent Rift segments.

Sudbury breccias are commonly attributed to meteoritic impact at about 1.85 Ga in the vicinity of the Sudbury Igneous Complex (SIC). In the Whitefish Falls area, about 75 km southwest of Sudbury, similar breccias are widely developed in argillites of the approximately 2.3 Ga Gowganda Formation. Complex shapes of diabase bodies and highly irregular contact relationships between diabase and argillites support intrusion of the diabase into incompletely consolidated sediments. Shaw, Young and Fedo (1999) suggest that these and other data indicate that the Whitefish Falls breccias may have formed as a result of interaction between hot mafic magma and semiconsolidated, water-rich mud more than 350 Ma prior to formation of the SIC and attendant phenomena that are presumed to be impact-related.

Slagel (1999) conducted experiments on the melting of phlogopite-calcite assemblages and applications to the evolution and emplacement of silicocarbonatite magmas in the crust.

Table 4. Publications received by the Sault Ste. Marie District office in 2001.

Title	Author	Type and Year of Publication
Summary of Field Work and Other Activities, 2001	Baker, C.L., Kelly, R.I., Parker, J.R.	OGS OFR 6070, 2001
Report of Activities 2000, Resident Geologist Program, Thunder Bay South Regional Resident Geologist Report: Thunder Bay South District	Schneiders, B.R., Scott, J.F., Smyk, M.C., O'Brien, M.S., Debicki, R., and Drost, A.	OGS OFR 6049, 2001
Report of Activities 2000, Resident Geologist Program, Red Lake Regional Resident Geologist Report: Red Lake and Kenora Districts	Lichtblau, A., Raoul, A., Ravnaas, C., Storey, C.C., Kosloski, L., Debicki, R. and Drost, A.	OGS OFR 6047, 2001
Report of Activities 2000, Resident Geologist Program, Thunder Bay North Regional Resident Geologist Report: Thunder Bay North District	Mason, J.K., White, G.D., O'Brien, M.S., Komar, C., Stewart, J., Debicki, R. and Drost, A.	OGS OFR 6048, 2001
Report of Activities 2000, Resident Geologist Program, Timmins Regional Resident Geologist Report: Timmins and Sault Ste. Marie Districts	Atkinson, B.T., Hailstone, M.H., Seim, G.Wm., Wilson, A.C., Draper, D.M., Farrow, D., Hope, P., Debicki, R. and Yule, G.	OGS OFR 6050, 2001
Report of Activities 2000, Resident Geologist Program, Kirkland Lake Regional Resident Geologist Report: Kirkland Lake and Sudbury Districts	Meyer, G., Cosec, M., Grabowski, G.P.B., Guindon, D.L., Hailstone, M., Stephenson, C., Wallace, L.M., Debicki, R. and Yule, G.	OGS OFR 6051, 2001
Report of Activities 2000, Resident Geologist Program, Southern Ontario Regional Resident Geologist Report: Southeastern and Southwestern Districts, Mines and Minerals Information Centre, and Petroleum Resources Centre	Sangster, P., McGuinty, W.J., Papertzian, V.C., Steele, K.G., Lee, C.R., Laidlaw, D.A., Carter, T.R., Spears, G.J., Debicki, R. and Rowell, D.	OGS OFR 6052, 2001
A Compilation of References for Kimberlite, Diamond and Related Topics	Sage, R.P. and Gareau, T.	OGS OFR 6067, 2001
Physical Evaluation and Assessment of Bedrock Aggregate Resource Potential, North Shore of Lake Superior	Jagger Hims Limited, Clayton Research Limited and Agritrans Limited	OGS OFR 6072, 2001
Results of Modern Alluvium Sampling, Chapleau Area, Northeastern Ontario: Operation Treasure Hunt - Kapuskasing Structural Zone	Ontario Geological Survey	OGS OFR 6063, 2001
On the Structural Geology of the Southern Province between Sault Ste. Marie and Espanola, Ontario	Jackson, S.L.	OGS OFR 5995, 2001
Canadian Journal of Earth Sciences (Special Issue: The Abitibi-Grenville Transect)	Brian Jones (Editor)	Volume 37 #2/3, March 2000
Hydrothermal Iron Oxide Copper-Gold & Related Deposits	T.M.Porter (Editor)	Australian Mineral Foundation Inc., November 2000

Table 5. Mineral deposits not being mined in the Sault Ste. Marie District in 2001.

Abbreviations

AF.....Assessment Files
CMH.....Canadian Mines Handbook
GR.....Geological Report
MDC.....Mineral Deposit Circular
MDIR.....Mineral Deposit Inventory Record
MLS.....Mining Lands, Sudbury
MR.....Geological Survey Canada Publication
NM.....*The Northern Miner*
OFR.....Open File Report
PC.....Personal Communication

Deposit Name/ NTS	Commodity	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References	Status
Pater Mine Spragge Twp 41J/2	Cu, Au, Ag	936 670 T @ 1.8% Cu	Rio Algom Limited	MR 1087	Past Producer 1969–1970
Bar–Fin Mine Thompson Twp 41J/3	Cu	1906: 130 foot shaft with 250 feet lateral work	Staked	MR 1087	Past Producer 1906
Bald Dome Prospec Plummer Add. Twp 41J/5	Cu	680 388 T @ 0.25% Cu		MR 1087	Inactive
Bruce Mines Plummer Add. Twp 41J/5	Cu, Ag	142 428 T @ 1.0% Cu above 155-ft level.		MDC 12	Past Producer 1915–1921
Campbell – Dukes Prospect Plummer Add. Twp 41J/5	Cu	33 000 T @ 1.2% Cu in 230' by 8' by 220' block		MR 223	Past Producer 1956
Rock Lake Mine Aberdeen Twp 41J/5	Cu, Ag	1898–1903: 420 foot shaft with 3 levels and 606 lateral development		MDC 12	Past Producer 1901–1903
Havilah Mine – Ophir Mine Galbraith Twp 41J/5	Au, Ag, Cu	1 main vein, 2 – 150 foot shafts, 1 – 183 foot adit		MDC 12	Past Producer 1892–1922
Steinberg Mine Plummer Add. Twp 41J/5	Cu	47 000 T @ 1.82% Cu or 124 000 T @ 1.1% Cu (drill indicated)		AF	Past Producer 1906 & 1956
Stobie Mine – Rainbow Mine Johnson Twp 41J/5	Cu, Ni, Au	9 T of ore shipped from 1 – 160 foot shaft with 20 feet of lateral workings		MDC 12	Past Producer 1899–1901
Bilton Option Patton Twp 41J/6	Cu	453 593 T @ 1.7% Cu	N/A	MR 1087	Past Producer Pre 1956
Boyea Lake Adit and East Zones Montgomery Twp 41IJ/6	Cu	Adit Area: 128 000 T @1.95% Cu probable & possible to 200 ft.; East Area: 56 500 T @ 2.98% Cu drill indicated to 250 ft.	N/A	Sudbury Contact Mines AR 1971	Past Producer Pre-1942
Crownbridge (Cannon) Prospect Kamichisitit Twp 41J/6	Cu	415 000 T @ 1.8% Cu diluted grade	N/A	MDC 12	Past Producer 1966–1967

Deposit Name/ NTS	Commodity	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References	Status
Glagoma Mine Gladstone Twp 41J/6	Cu	1917: 2 shafts sunk to 250 feet		MDC 12	Past Producer 1917 & 1962
Goulding Mine Cobden Twp 41J/6	Cu	1962: 816 T @ 1.4% Cu shipped from mine		MDC 12	Past Producer 1962
North Montgomery – Grand Portage Mine Montgomery Twp 41J/6	Cu	147 677 T @ 1.7% Cu – Main Zone 40 9000 T @ 1.96% Cu – No 1 Zone 77 063 T @ 3.23% Cu – No 2 Zone 61 688 T @ 1% Cu – West Zone	N/A	MR 1087	Inactive
Milgate (Abbican) Prospect Nouvel Twp 41J/6	Cu	95 934 T @ 1.08% Cu (drill indicated) A Zone L-600'/ W-10'/ D-235'		MR 1087	Inactive
Principle Strategic Minerals Prospect Gladstone Twp 41J/6	Cu	112 300 T @ 1.54% Cu (drill indicated)		NM MDC 12	Inactive
Sheba Prospect Nouvel Twp 41J/6	Cu	L-1000 ft. by W-3 ft. on surface @ 0.59% Cu	N/A	MDC 12	N/A
Twin Lakes Prospect Esten Twp 41J/7	Cu	Probable - 76 900 T @ 1.73% Cu over 8.04 ft.	N/A	MDC 12	
Bi-Ore Mine Sagard Twp 41J/10	Cu	13 607 T @ 6% Cu	N/A	MR 1087	Past Producer 1947–1949
Cheney Mine Gould Twp 41J/11	Cu	39 405 T @ 3.97% Cu (drill indicated)	N/A	MDC 12	Past Producer 1966–1967
Copper Prince Mine Kamichistit Twp 41J/11	Cu, Au	45 359 T @ 3% Cu 4 ore shoots near surface		MR 1087	Past Producer 1972
Jardun Mine Jarvis Twp 41K/9	Pb, Zn, Ag, Cu, Au	49 367 T @ 4.4% Pb, 3.1% Zn, 1.42 oz/T Ag	N/A	MDC 12	Past producer 1954 – 1957
Kerr Scott Deroche Twp 41K/9	Pb, Zn, Ag, Au	1859 T of hand-cobbed ore recovered. Deposit reserves have not been calculated		MDC 12	Past Producer 1939
Goulais River Vankoughnet Twp 41K/11	Cu, Ag	250 000 T @ 2.35% Cu, 0.26 oz/T Ag in 3 zones (drill-indicated)	N/A	MR 223	Past Producer 1975 & 1981
Kristina Mine LaVerendrye Twp 41K/11	Cu	369 350 T @ 1.95% Cu in No 4 and No. 6 shaft zones	N/A	MDC 12 MR 223	Past producer 1903–1907

Deposit Name/ NTS	Commodity	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References	Status
Prace – Sill Lake Mine Vankoughnet Twp 41K/16	Pb, Zn, Ag	340 T Pb, Ag concentrate produced Deposit reserves have not been calculated	N/A	PC	Past Producer 1981 & 1985–1987
Caputo – Just Wishart Twp 41N/1	Cu	475 T @ 11.18 % Cu recovered from 3 zones		MDC 12	Past Producer 1968
Coppercorp Mine Ryan Twp 41N/2	Cu, Ag, Au	1 360 777 T @ 1.7% Cu in C Zone 362 873 T @ 2.3% Cu in C-2 Zone 589 670 T @ 2.1% Cu in SB Zone 444 520 T @ Cu in Silver Creek Zone	N/A	MR 1087	Past Producer 1964–1972 1 M Tons recovered
Glenrock Palmer Twp 41N/2	Co, Au, Cu	Several zones – main zone L 250 ft. W 3.5 ft. (drill indicated)		MR 1087 MDC 12	
Jogran Prospect Ryan Twp 41N/2	Cu, Mo	L-600 ft W- 400 ft D-680 ft @ 0.053% MoS_2, 0.19% Cu (drill indicated)		MDC 12 MR 223	
Mamainse Mine Ryan Twp 41N/2	Cu	Vein L – 1500 ft W – 13 ft 3 shafts sunk to depth 60, 280, 1500 ft.		MDC 12	Past Producer 1882–1884
Maricona Prospect Slater Twp 41N/2	Cu	267 986 T @ 1.17% Cu reserves in 3 sections		MDC 12	
Pancake Lake Kincaid Twp 41N/2	Cu	L 300 ft W-21.5 ft D-200ft @ 0.76% Cu (drill indicated)		MR 1087	
Tribag Mine Nicolet Twp 41N/2	Cu, W, Ag, Au	2 267 961 T @ 1.6% Cu – Breton Zone 113 397 092 T @ 0.13% Cu, 0.27% Mo in East Breccia Zone 429 688 T @ 1.6% Cu – West Breccia 929 864 T @ 2.3% Cu – H Zone 907 184 T @ 0.2% W in Tailings – H Zone	Channel I	MR 1087 MDC 12	Past Producer 1967–1973 Production from Breton & West Breccia zones

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Metric Conversion Table

Conversion from SI to Imperial			Conversion from Imperial to SI		
SI Unit	*Multiplied by*	*Gives*	*Imperial Unit*	*Multiplied by*	*Gives*
		LENGTH			
1 mm	0.039 37	inches	1 inch	**25.4**	mm
1 cm	0.393 70	inches	1 inch	**2.54**	cm
1 m	3.280 84	feet	1 foot	**0.304 8**	m
1 m	0.049 709	chains	1 chain	20.116 8	m
1 km	0.621 371	miles (statute)	1 mile (statute)	**1.609 344**	km
		AREA			
1 cm^2	0.155 0	square inches	1 square inch	**6.451 6**	cm^2
1 m^2	10.763 9	square feet	1 square foot	**0.092 903 04**	m^2
1 km^2	0.386 10	square miles	1 square mile	2.589 988	km^2
1 ha	2.471 054	acres	1 acre	0.404 685 6	ha
		VOLUME			
1 cm^3	0.061 023	cubic inches	1 cubic inch	**16.387 064**	cm^3
1 m^3	35.314 7	cubic feet	1 cubic foot	0.028 316 85	m^3
1 m^3	1.307 951	cubic yards	1 cubic yard	0.764 554 86	m^3
		CAPACITY			
1 L	1.759 755	pints	1 pint	0.568 261	L
1 L	0.879 877	quarts	1 quart	1.136 522	L
1 L	0.219 969	gallons	1 gallon	**4.546 090**	L
		MASS			
1 g	0.035 273 962	ounces (avdp)	1 ounce (avdp)	28.349 523	g
1 g	0.032 150 747	ounces (troy)	1 ounce (troy)	**31.103 476 8**	g
1 kg	2.204 622 6	pounds (avdp)	1 pound (avdp)	**0.453 592 37**	kg
1 kg	0.001 102 3	tons (short)	1 ton (short)	**907.184 74**	kg
1 t	1.102 311 3	tons (short)	1 ton (short)	**0.907 184 74**	t
1 kg	0.000 984 21	tons (long)	1 ton (long)	**1016.046 908 8**	kg
1 t	0.984 206 5	tons (long)	1 ton (long)	**1.016 046 90**	t
		CONCENTRATION			
1 g/t	0.029 166 6	ounce (troy)/ ton (short)	1 ounce (troy)/ ton (short)	34.285 714 2	g/t
1 g/t	0.583 333 33	pennyweights/ ton (short)	1 pennyweight/ ton (short)	1.714 285 7	g/t

OTHER USEFUL CONVERSION FACTORS

	Multiplied by	
1 ounce (troy) per ton (short)	31.103 477	grams per ton (short)
1 gram per ton (short)	0.032 151	ounces (troy) per ton (short)
1 ounce (troy) per ton (short)	20.0	pennyweights per ton (short)
1 pennyweight per ton (short)	0.05	ounces (troy) per ton (short)

Note: Conversion factors which are in bold type are exact. The conversion factors have been taken from or have been derived from factors given in the Metric Practice Guide for the Canadian Mining and Metallurgical Industries, published by the Mining Association of Canada in co-operation with the Coal Association of Canada.